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WISCONSIN ACADEMY

OF

SCIENCES, ARTS, AND LETTERS

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THIRTY-FIRST ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1900.

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."

Ἐπιστολὴ πρὸς Ῥωμαίους, I 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1901.

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Contents.

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RULES.

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1. That this Society be called the "Wellington College Natural Science Society."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the Number of Associates to Seventy.

3. That only members of the Upper School, with Upper Middle I and the Upper and Middle Seconds, be eligible as Associates, or be admitted to lectures; but that the Committee have power to elect or admit members of the Middle School who have shewn special interest in Science or Art. And that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

5. That the Officers of the Society and of the Photographic, Field Club, and Art Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

6. That the Secretary, and Treasurer, be elected annually at the last Meeting of the Midsummer Term.

7. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

8. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

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9. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

10.—That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

11. That in the absence of any officer, the Committee appoint a Deputy.

12. That Honorary Members and Corresponding Members have all the privileges of Members.

13. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

14. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions persons who have lectured before the Society, and other Benefactors.

15. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names, with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President; and that Members be elected by the Committee.

16. That Members pay a subscription of 1s. 6d., and Associates of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

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17. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last Meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

18. That Members may speak and vote at all Meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

19. That Associates may speak at all Meetings; and may read Papers with the leave of the President.

20. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

21.—That Prefects may attend all Public Meetings without tickets.

22. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

23. That meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

24. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

25. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

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26. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

27. That a certain number of Officers be told off to collect the exhibitions.

28. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

29. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

30. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

31. That additional members, elected by the provisions of Rule 30, need not be in the Upper School.

32. That there be a Photographic Section, a Field Club Section and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That the Sections have the right of electing their own Officers and of making and altering their own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

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SECRETARY OF THE PHOTOGRAPHIC SECTION—F. A. NICOLSON.
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For OOLOGY, C. M. ROGERS.
For ENTOMOLOGY, C. T. BROOKES.
DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, Esq.

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Those Members and Associates whose names are marked *p* are members also of the Photographic Section. Those marked *f* are members of the Field Club Section.

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C. E. H. DAVIES
C. F. K. CARFRAE
A. T. G. BECKHAM
A. R. FORSYTH

* Left Lent Term, 1899. † Left Easter Term, 1899. ‡ Left Christmas Term, 1899.

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*Cheltenham College N.H.S.

*Marlborough College N.H.S.

Clifton College N.H.S.

*Rugby School N.H.S.

*Dulwich College N.H.S.

*Haileybury College N.H.S.

*Uppingham School N.S.S.

King Edward's School, Birmingham, N.H.S.

*Felsted School N.H.S.

*Epsom College N.H.S.

*East Kent N.H.S.

British Museum (Natural History).

*U. S. Geological Survey Office.

Linnean Society.

*Royal Meteorological Society

*Chicago Academy of Sciences.

*Wisconsin Academy of Sciences, Arts and Letters.

Geological Survey Office.

Nature.

Science Gossip.

* Those marked with an asterisk exchange Reports with us.

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ACCOUNTS.

RECEIPTS.

	£	s.	d.
Balance in hand	99	0	3
Subscriptions:			
Lent Term—Honorary Members ...	5	5	0
Members and Associates	5	1	0
Easter Term—Honorary Members ...		4	6
Members and Associates	6	13	0
Michaelmas Term—Honorary Members		3	0
Members and Associates	4	18	6
Bursar, for use of Lantern		10	0
Sale of Report	8	1	8
Sale of Old Cabinet		10	0
Interest on Deposit	1	9	6
	£131	16	5

EXPENDITURE.

	£	s.	d.
Gas and Limes for Lectures		15	11
Carriage of Parcels		13	5
Stamps	1	0	5
Hire and Purchase of Slides	1	8	4
Hook, for reading Thermometers... ...	2	0	0
Boxes, Lists, &c., for Museum	1	6	10
Printing Report	11	3	6
Stationery, Notices, &c.	1	0	3
Balance in hand	112	7	9
	£131	16	5

Examined and found correct,

December 17th, 1900. S. A. SAUNDER. E. S. G. WICKHAM, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 24th.

H. W. Monckton, Esq., F.L.S., F.G.S. (O.W.), gave a lecture on "The Fiords and Glaciers of the Bergen District, Norway."

The first slide was a map of the Bergen district, showing the relative positions of the Sogne Fiord and the Hardanger Fiord. The Lecturer then gave us a view of Bergen, and pointed out some of the interesting buildings, among which was a very quaint old church and tower. We next saw how the land had risen to such an extent that most of the town was built on the ancient beach, which several centuries ago would have been several feet under the sea. He then, in a number of very pretty views, took us up the Sogne Fiord to a snow field at the top of the fiord, after which he showed us the glaciers, explaining how the old snow after remaining on the mountains for a year or so becomes ice, which gradually slips down the sides of the mountain into the valleys, thereby forming rivers of ice. The next slides gave us a few glimpses of the glaciers when they have arrived at the point where the ice melts, and becomes a muddy rivulet. The Lecturer also drew attention to the mounds of débris piled up to the height of several feet all round, which had been brought down from the mountains by the glaciers. He then took us to the Hardanger Fiord, and pointed out some of the most important glaciers, &c., on a map. Having shown us some very picturesque views of mountain villages and lakes on the overland journey from the Sogne to the Hardanger Fiord, he also explained how most of the lakes were formed by the débris from the glaciers blocking up the valleys, because in course of time the glaciers melt and their place is occupied by lakes. All fiords had at one time been filled by glaciers, as was proved by the smoothness of the rocks on the mountain-sides, which would be caused by the ice passing over them. He again showed us another great snow field, about twenty miles in extent. The last slides were some photographs of peasants in their national costume, a few more moorland views, and a snap-shot taken from the fiord on board a steamboat, of the landing stage. These views concluded a most entertaining lecture, which gave us some idea of the majestic beauty and grandeur of the snow clad cliffs on the western coast of Norway.

A vote of thanks to the lecturer was proposed by Mr. Fitz-Gerald.

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Saturday, March 10th.

J. S. Furley, Esq., gave a lecture on "Olympia, its Art and Games."

The Lecturer began by emphasizing the fact that the Greek games had a distinct religious setting, and consequently they were not merely athletic contests. Games were held every four years at Olympia in Elis, and by these games the Greeks reckoned their time, counting every four years an Olympiad. The games began in 776 B.C. and lasted twelve centuries, through the sway of the Greeks, Romans, and Byzantine Emperors, and ended in 893 A.D., during the reign of Theodosius I. Alaric, at the head of the Goths, swept over Greece, and destroyed many of the buildings at this time, though he did not effect so much damage as is popularly believed. In 426 Thodosius II. had many public buildings destroyed, believing that they encouraged heathen ceremonies. A century later a great earthquake took place which furthered the efforts of the Emperor. About 600 occurred the invasion of the Slavs, who completed the work of destruction. Very little of the district which had been once thickly populated was then inhabited. Olympia was situated in the valley of the Alpheus, which runs through Elis, a state in the western portion of the Peloponnese. Olympia was divided into two portions. The first, called the Stadium, being the arena, was devoted to the athletics, and the second, the "Altis," was the sacred grove which comprised the sanctuaries connected with the games. Slides were then shown showing the present condition of Olympia, and what it probably was like at the time of the games. The site of the ancient town was shown in a remarkably clear map. The lecturer then explained to us how the "Altis" and the "Stadium" were connected. In order that the games might be freely attended a sacred truce was proclaimed at the time when the games were being held. The reason that we know so much about the site of the temple is that the German savants, headed by Curtius, excavated the ruins, a subsidy of £40,000 being devoted for the purpose by Government. This work occupied six years. In the temple of Zeus, which was the finest building in Greece at that time, the columns which supported the roof were seven feet in diameter, of which the outside layer was of marble, painted on the outside. Some of the finest bas-reliefs in the world have been discovered round the "Architraves" of this temple. Inside was a most remarkable statue of Zeus himself, made of ivory and gold, which reached almost to the roof, symbolical of the majesty of Zeus. Slides were then shown of statuary and relics of all the minor temples round about, including the masterpiece of Praxiteles, the famous Hermes—

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"τῶν θεῶν διάκτορος." The games took place in July or August, which are the hot months in Greece as in Western Europe. There were five divisions in the athletic sports: military sports, horse and chariot racing, boxing and wrestling, foot racing, and throwing the "Discus." A few slides taken from pottery dug from ruins over all Greece illustrated the typical Greek athlete. Contrary to the usual custom of the Greeks, there were no valuable prizes given at Olympia, the only reward being a crown of wild olive. A prize-winner at Olympia became the hero of his district was exempt from taxes, and in some cases was awarded a pension. This brought a most interesting lecture to a close.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, March 24th.

C. R. ASHBEE, ESQ. (O.W.), gave a lecture on "William Morris and his work."

Morris was of the Pre-Raphaelite school, and so varied was his genius that his envious critics said of him that he was poet, upholsterer and socialist at once. He was remarkable for the number epics which he produced, of which the Earthly Paradise, is the best known, and also for the terseness and directness of his language; although what he wrote was poetry, it was intelligible to all, without losing its poetic rythm. As examples of Morris's great talent the lecturer read several passages of prose and poetry which illustrated the poet's fine imagination. Several slides were then shown illustrating Morris's artistic work, and the workshops in which he worked, for Morris was a great engraver and artist as well as a painter. In fact he originally started as an engraver of wood blocks, and an art designer, taking up literature only in his later life. Among the slides were shown pleasing representations of Morris's great artistic masterpiece, a tapestry, now in Exeter, which has for its subject the mysterious journey of the Magi, and in particular the lecturer drew attention to the marvellous way in which the Magi had been given translucent halos, by which, as he explained by showing a slide, the background might be seen through the wool which formed the halo. This was a secret process only known to the artist. Of this tapestry there was a copy at Eton College. Morris was also a great designer of stained glass windows, which he made in the old-fashioned way, for thus, as he insisted, they were less affected by time. Several photo-

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graphs of his best-known windows were then shown. Several of Morris's wood blocks were shown, in which he showed his usual industry and aptitude. The type which Morris used for printing his books was remarkably clear, and in spite of many ornamentations it was far clearer than any ordinary book type, and much more pleasant to the eye.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

Saturday, May 19th.

Professor G. S. Boulger, F.L.S. (O.W.), gave a lecture on "Gilbert White and Selbornian Principles."

The lecturer apologized for speaking of such a homely subject, as any study of Gilbert White was bound to be when events of such stirring importance had just been enacted in South Africa. After the prolonged cheers had subsided, Professor Boulger made a few introductory remarks about the great naturalist, his parentage, private life and native village. White was born in 1720 in the little Hampshire village of Selborne, of which his grandfather was vicar. He was educated at Basingstoke Grammar School and Oriel College, Oxford, of which he became a Fellow, and in 1752 Junior Proctor. In 1755 he settled in Selborne, and through all his life he was a great stay-at-home; he seldom went out of his own county, and never left England. The great value of his book, therefore, is that it proves how much can be done and learnt at home and in a limited area. The letters which he wrote to his friends and fellow-naturalists, Pennant and Barrington, began in 1767, and the Diaries which he kept for 27 years contain notes of interest connected with the temperature, the weather, and any strange things which he saw happening around him. The fact that Gilbert White sometimes makes mistakes does not in any way detract from the value of his book or disqualify it for a place among the English Classics. A series of very interesting lantern slides were then shown, including photographs of the village of Selborne, the Hanger, the butcher's shop where White planted three elm trees, the "Well-Head," from which the village is supplied with water, various parts of "the Wakes," the house where Gilbert White lived and worked, the sun-dial by which he made his observations, the famous zig-zag path and wishing stone, the church, where White is buried and the great yew-tree standing by it, and the tablet inside the church, erected to the memory of the world-renowned naturalist. The lecturer then went on to give some practical hints as to natural history work in the field in view of the Field Club

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Section of the N.S.S., which had just been started. Such work serves as an incentive and introduction to further study; it is also absolutely necessary for obtaining material for laboratory work, and it gives those who practice it an opportunity of studying plants and animals living and not dead, and in their natural surroundings. No inquisitive mind could fail to find abundant entertainment in any country walk, however short. Such work, too, brings the would-be naturalist face to face with facts at once, but care must be taken to avoid allowing field work to fall gradually into a mere mania for "collecting." Collecting is, of course, necessary, but it must be turned to some practical purpose to be of any real use. A naturalist ought to be a missionary, and try to enforce his principles on others. It was here that Gilbert White fell short of the ideal naturalist, and it is the object of the Selborne Society to remedy that defect in the man to whom it owes his name.

A vote of thanks to the lecturer was proposed by Mr. Fitz-Gerald.

Saturday, June 2nd.

Arthur N. Butt, Esq., F. R. Hist. S., gave a lecture on "William Caxton, and what he did for England."

It sometimes did us good, the Lecturer began by saying, in spite of the stirring events of national history which were being enacted, to take a look into the far past and see what our ancestors used to do in times when there were no such things as railways and many other modern inventions. He wished to take us back that night to St. Simon and St. Jude's Day, 1449, to the corner house in Old Jewry, where Caxton was serving as apprentice to the Mayor. He did not remain long in this capacity, but went abroad and settled at Bruges, where he held a post of great importance as acting governor of the "Merchant Adventurers," a guild formed for the promotion of trade. In 1468, Caxton married and began to translate a French book into English which he completed in 1471. There was a very large demand for the book, and so tired did he become of copying it, thal he began to cast about him for some means of copying without so much manual labour. He then came to England and set up a printing press at Westminster, his object being to reproduce manuscripts. Printing had made considerable advances abroad by this time, and in England the original wood-cut types were soon replaced by moveable metal ones. The setting up of the type was very different from what it is now. A great resemblance may be seen between MSS and early

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printed matter, and the dates of books may be learnt from the form of the type. As printing advanced it gradually became less and less like the old MSS writing.

Caxton pressed steadily on in England, and it is interesting to note that he published the first advertisement. He published various books, including an edition of Æsop's Fables with illustrations, the Works of Chaucer, and the Statutes of Henry VII., the first published in England. The Lecture was illustrated by numerous slides, including one of the only book Caxton ever printed with illuminated borders.

Caxton was not a brilliant man, but a very worthy one. He had the advantage of a good education and was a clever linguist with a decided literary taste. His printing was probably superior to that of the last century.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, June 30th.

S. A. Saunder, Esq., gave a lecture on "The Evolution of Worlds."

Modern theories with regard to the origin and development of our own and other worlds stand on a very different basis from those of the ancients. These latter were pure speculations, the former are founded on the laws of Nature, and some of their conclusions are the results of exact reasoning and capable even of numerical expression. The first to form a system of Cosmogony based on Newton's Law of Gravitation was Kant. The only members of the solar system known in his time were the sun, six planets and ten satellites; but it was also known that all these were revolving round the sun, or their primaries, in orbits very nearly circular, in the same direction, and nearly in the same plane, whilst all those which were known to rotate on their axes rotated also in the same direction. This uniformity was too remarkable to be the result of chance, and Kant suggested that the material of which the system is now formed had once filled the whole space enclosed by the outermost orbit. His knowledge of mechanics was not sufficient to enable him to furnish a satisfactory explanation of the process by which the different worlds had been evolved, but shortly afterwards the same idea occurred to one of the greatest mathematicians that ever lived, and was so developed by him that it is now generally spoken of as the Nebular Theory of Laplace. According to this Theory the original nebula, out of which the solar system was to be formed, was intensely hot, as it cooled it contracted, and as it contracted it rotated, slowly at first but gradually faster and

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faster. As the velocity increased it would bulge out at the equator, until at last the strain would be too great, the outer part would break off and be left behind as a revolving ring like that of Saturn. The central mass, continuing to contract, would throw off a second and a third ring in the same way. As these rings cooled, the material of which they consisted would in general collect around the densest portion and form a planet, which in the same manner might form rings and satellites. The same idea of the gradual transformation of a shapeless chaotic mass into such a system as our own, was at about the same time suggested to Sir W. Herschel as the result of his telescopic observations of the nebulæ. A number of photographs of nebulæ were thrown on the screen, and an endeavour was made to trace the different stages of development.

Laplace's theory still offers in its essential features the best explanation that can be given of the development of our system, and some of the difficulties encountered in its original presentation have been considerably modified. But Professor G. H. Darwin has also shown that our own moon was probably broken off from the earth in a different way; perhaps by the enormous disturbance that would have been produced when the earth's rate of rotation was such that gravitation would only just hold it together, and the period of the solar tidal wave was nearly the same as that of a free oscillation of the whole mass. The moon has been brought to its present distance from the earth by the action of the tides it has generated on the earth, and the fact that it always presents the same face to us is probably due to the action of tides raised on the moon by the earth. The planets themselves are too small as compared with the sun to have had their distances from the sun sensibly affected by the same cause, they must have been formed nearly at their present distances, and the same may be said with regard to their satellites. The solar tidal friction, however, probably accounts for the absence of satellites to the interior planets. The tides reduced the rotation so rapidly that it never rose high enough to necessitate the rupture of a ring.

Darwin and Poincaré have also considered further the conditions under which a rotating fluid mass may break up into two pieces, and See has suggested that we here find an explanation of the manner in which double stars were formed, whilst the further action of tidal friction accounts for the eccentricity or ovalness of their orbits. He also finds in Sir John Herschel's drawings of double nebulæ evidence that this process of rupture is going on under our observation.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

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Saturday, July 14th.

G. K. Allen read the Essay on "The Stone Age," for which the Pender Prize had been awarded to him.

How long ago was the Stone Age? When did it exist? are about the first questions we ask, and very hard questions they are to answer — firstly, because the Stone Age did not exist over all the world at the same time, since the Australians and New Caledonians for instance have only recently left off using stone implements: secondly, we have only faint conceptions of the length of the intermediate ages--namely, the ages of bronze, copper and iron, which we know to have existed, and each of them at the very least must have occupied 2000 years and probably a great deal more. So the latest period of the Stone Age must be at least 6000 years ago: some authors have attempted to place the limit at 5000 or 7000 years but with such scanty evidence they cannot be trustworthy. By paying strict attention to Stratigraphy and Palæontology, Modern Science is gradually working out the answer and we can only hope that at some future day we may consider ourselves to be fairly near the truth: but at present we must regard the Stone Age as having existed between five and twenty thousand years ago.

It is first necessary to state that the Stone Age has been divided into two very distinct and separate parts—the first is call the Palaeolithic (πάλαιος=old—λίθος=A Stone) Age which is the earliest of the two and the second is the Neolithic (νέος=new) which is the latest and most recent of the two. This separation is drawn owing to the marked differences and distinctions in the stones which will be explained hereafter. The implements of the Palaeolithic Age are the oldest and first evidences of man on the earth and naturally his first attempts at working in stone and making weapons would be very rough. All the weapons of this age are very roughly chipped into shape and shew a very low state of civilisation. They have no signs of ever having been polished or ground such as is distinct in the weapons of the Neolithic Age. In form there does not appear to be much variety as the weapons are generally either round or oval: occasionally they are thick and heavy at one end and get thinner to a point at the other end. They vary in length from about five to fifteen inches. The places where they have been found are in low levels by river beds, old undisturbed strata and in old caves.

The Arrow heads of the Neolithic age are for the most part elegant little things and beautifully worked. They range in length from about one inch to six inches. So numerous are the forms,

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that they have been divided into classes under the names of leaf shaped, lozenge shaped, and triangular. Some of these have a central tang or peduncle, others have not: nearly all have the two barbs though a few are without both them and the tang. All of these were of course hafted, though naturally many are found without the shaft: the tang was generally introduced into a split piece of wood and then bound tightly in with ligaments. Those which did not possess a tang were practically hafted in the same manner though not so much of the arrow head would project beyond the shaft. These arrow heads are frequently found in ancient tombs and burrows, and it has even been suggested that they were used more as ornaments than as weapons. It certainly might have been the case with the smaller ones, as even to-day they are to be found worn as armlets or charms by some country people to ward off disease and to ensure good luck.

After the essay had been read Mr. Kempthorne shewed a number of lantern slides by members of the Photographic Section, and a very interesting series of snap-shots taken by an officer with Methuen. These latter were contributed by R. Lascelles.

Mr. Davenport congratulated Allen on the excellence of his essay, and proposed a vote of thanks to Mr. Kempthorne and the members of the Photographic Section who had contributed to the exhibition.

Saturday, October 6th.

A. A. Somerville Esq., gave a lecture on "The Union Brigade."

The lecturer began by saying that the three regiments which compose the Union Brigade are the Inniskillings, the Royals and the Scots Greys. They were all raised about the same time, in the last half of the seventeenth century: two of the regiments were raised to fight against the Stuarts and one of them to fight for them. The Royals have for their Colonel in Chief, the German Emperor, whose portrait was shown on the screen: on their colours they bear the names of Dettingen, Sebastopol and Waterloo. The Inniskillings were originally an Irish regiment raised in the war between the Stuarts and William III; they fought at the battle of the Boyne The Colonel in Chief of the Scots Greys is the Duke of Connaught. All three regiments fought at Waterloo and Balaclava, and they are now together in South Africa. In 1743, owing to the treaty of Bourbon and the opposition to English trade, the allied forces of Britain and Austria, under Lord Stair, found themselves in the middle of Europe with forty thousand men, sixteen thousand of whom were British, opposed by a far greater army of Frenchmen, under Marshall Noailles. The allies had to march through Dettingen, and the pass there

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had been seized by the French, whose position on the mountains and behind the river was one of great strength. Owing to the impetuosity of Grammont, the French suffered a great defeat at the hands of the British: the Greys distinguished themselves, and a certain private Brown was knighted on the field by George II for capturing a flag.

The term "Union Brigade" dates from Waterloo, when the three regiments charged, together with the Household Cavalry. There, when they came into action the Royals, on their appearance, caused two thousand men to surrender, the Inniskillings smashed through the two next columns and the Greys annihilating three regiments, put forty guns out of action further up the valley, reached the second line of the French Lancers where they would have been routed but for the support which came up from behind. The story was illustrated by plans and a picture of the Greys in their charge. We were then told the story of the charge of the Heavy Brigade at Balaclava. When the Russians were advancing on Balaclava, which was the base of the British army, only the 93rd Highlanders were in position to oppose them. Seeing this, the Heavy Brigade, under Brigadier-General Scarlett, were ordered to go to their assistance. On their appearance the Russians for some reason or other halted. Our men wheeled into line. The Bugle sounded the "Charge" and three hundred British Cavalry dashed into the midst of three thousand Russians. The Russians opened out and made lanes but their attempts to surround the British were frustrated by other charges. The British were swallowed up in the mass but the Russians broke up and disappeared over the ridge. Scarlett himself rode fifty yards ahead of the division and survived, and Eliott, another officer, rode through bare headed and received fourteen wounds. The Charge has been immortalised by Tennyson's poem, part of which the lecturer read. The lecture was admirably illustrated by slides and by selections from poems.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

Saturday, October 20th, 1900.

F. Morley Fletcher, Esq., gave a lecture on "Colour printing from Wood-blocks."

The lecturer began by pointing out that the coloured printed pictures we get in our Christmas numbers, etc., are merely reproductions, and however faithful they are to the originals they do not give you the exact expression or idea which the painter conceived. At an early age the Chinese practised colour-printing from wood-blocks, but it was brought to absolute perfection by

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their more clever neighbours, the Japanese. The Japanese art of to-day is not nearly so good as it was eighty years ago, but still all the English methods are based on the old Japanese ones. The process for making the commercial prints is very elaborate, comprising a large amount of machinery and stone-work: the wood-block method is very simple, the two main requirements being a small sharp knife and a rubber pad for imprinting the design on the paper from the wood. The paper used is Japanese, which is made from the fibrous material of the inside bark of the mulberry tree. To begin with, the outline drawing is pasted face downwards on a block of cherry-wood and then the lines are cut with the small knife; there are really two lines cut, and when finished there is a small ridge thicker at the base than at the top standing up with a trench on either side: the intervening space is then chiselled away. This key-block is then inked and the print is taken by the help of the rubber pad; any number of prints may be taken, and the later ones are usually better than the first half-dozen or so. The print is next rubbed on another block to receive the colour; a separate block has to be used for each colour. Mr. Fletcher illustrated this by printing a picture of the Harpies. To conclude with, these pictures are very cheap and are in reality originals, having all the beauty and tone of the block they are taken from.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, November 10th.

J. C. Melliss, Esq., gave a lecture on "St. Helena."

The Lecturer began by pointing out the position of St. Helena on the map; it is about 1,100 miles from the West coast of Africa, and lying in the centre of the Trade Winds plays an important part in commerce; it is 10 miles long by $8\frac{1}{4}$ miles broad, having an area of about 30,000 acres. The mountains range from 2,000 to 3,000 feet in height: on the South side they form half the ring of an ancient crater running down to the shore: we saw several slides of these mountains and also of those on the North side which slope down to the sea, these latter showing the geological structure of the island. The island was discovered by a Portuguese, Don Juan, in 1501 on the anniversary of the birthday of the Emperor Constantine's mother, after whom he named it St. Helena. Captain Cavendish, who went there in 1588, was the first Englishman to visit it; it was abandoned by the Dutch in 1658 and taken by the English: the Dutch recaptured it twice, but it was retaken by the English and has since remained in our hands. The island has seemed destined to play the part of a state prison;

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400 years ago a Portuguese noble was confined there, and later on some Zulu chiefs were placed there by the British government whilst, as is well known, the great Napoleon also ended his days there; at the present moment there are some 5,000 Boer prisoners there and with them Commandant Cronje. We then saw some slides of Jamestown the capital which lies in a valley close to the coast; the next slides consisted of the house in which Napoleon spent his first night in St. Helena, the house in which he spent the next three months, and the house at Longwood, which was his final residence, and of the surrounding country. The next was of Napoleon's tomb, where his remains rested for twenty years till they were removed to Paris. The island has a population of about 5,000, consisting mostly of whites. We then saw some pictures of the flora, the birds and the fish peculiar to the island. Extremes of heat and cold are unknown in the island, it is very healthy and forms a most pleasant place of residence; it is very productive, fruit is found in large quantities and sport may be had. The Lecturer concluded by showing a slide with a picture of the house where Cronje is living and the camp where the Boers are located.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

Saturday, November 24th.

G. E. Blundell, Esq., gave a lecture on "Our Early Ancestors."

Mr. Blundell began with an explanation of "The Subject of Evolution." Darwin's theory is, that in human beings and animals there is a great tendency to vary; as new varieties come into existence in course of time they become species. The first slide was of a wild inhabitant of the forests of Borneo, and of a woman of a very low race in Mexico, and they certainly bore some resemblance to each other, and so support Darwin's theory. The second slide compared the skeletons of a man and a gorilla with each other; many resemblances were pointed out, as also were the differences. Some of the rudest traces of human nature, such as making rough shelters and using stones and boughs of trees for weapons, are found in certain of the ape tribe. Conspicuous features in the character of apes are, affection, jealousy, curiosity, instinct, a liking for sweet things, and dislike at first for alcohol and tobacco, and afterwards a craving for them; some amusing stories were told to illustrate each of these. In the muscles there are also certain resemblances between man and the ape; some resemblances are more

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conspicuous in the very young, as for instance, a baby crawls in the same manner as an ape does, and it can also hang on to a bar longer than an adult can, thereby proving that this faculty was advantageous to our early ancestors but that it is not now required. Against these, the subjects of Religion and Language may be brought up; but some of the lowest tribes in Australia have not the slightest idea of any Being higher than themselves, and have about a dozen words in their language. Till quite lately no connecting link had been found, but a short time ago some remains were found in Java which almost filled up the vacant space.

From the Ice Age it is presumed that man inhabited Western Europe from ten to fifteen thousand years ago. Weapons are found in river beds and in caves, in the latter at a lower level than the remains of hyaenas which abounded in England at that period. We then saw a skull of an Aboriginal Australian showing the very low forehead and the high ridge over the eyes which denote a low type of nature. The next slides were of some palaeolithic and neolithic weapons, followed by some pictures of cave dwellings and prehistoric man. We then saw some pictures of man's earliest drawings of the horse and the bear, which are not to be despised when we consider that they are much older than the pyramids. The next slides were of some mounted stone axes and knives, and the last one was of a Swiss Lake dwelling; many weapons and traces of civilisation have been found in these, as most of the dwellings have been burnt and charcoal is very durable.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, December 8th.

R. B. Hayward, Esq., F.R.S., gave a lecture on "The Isle of Wight in regard to its Physical Geography and Geology."

Mr. Hayward began by pointing out, on the map, that the Island contains all the strata of the East of England, and that more varieties of strata are found in the Island considering its size than in any other portion of the globe. We then saw a slide of the Island and a conspicuous ridge of chalk downs running across the centre from East to West, varying in height from two to seven hundred feet. In this central ridge there are three gaps which determine the course of the rivers, running as they do from South to North. The Eastern half of the Island corresponds to the Western half: on the high ground in the South East of the Island very sharp gravel is found. The next slide was of some cliffs showing the layers of Upper Greensand and Blue Clay: the

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former absorbs water, which on sinking through forms springs and thus supplies the Island with water. At Sandown are found the lowest strata in the Island: going Southwards we saw pictures of Shanklin Chine, which is only a gash in the strata cut by water, and of cliffs showing the different sandstones: going Northwards from Sandown we find cliffs of clay and greensand sloping very steeply towards the North: Culver Cliff was the next slide and in this the stratification is almost vertical. The West coast strata, consisting of clay and sandstone, were then thrown on the screen. The next slides were of Blackgang Chine, and the sandstone at the South point. On the North West coast, some pine trees are found embedded in the strata, being brought down ages and ages ago by rivers. Some slides of Compton Bay and Compton Chine, the Needles which were continuous with some cliffs in Dorset, Culver Cliff, Alum Bay and the Hampstead Rocks the highest point in the Island concluded a most interesting lecture.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Saturday, February 10th.

At a P.B.M., R. T. Foster, H. Symons, F. L. Fraser, H. R. Moore, W. A. Stirling, D. W. Payne, J. C. Forsyth, C. E. G. Vernon, R. H. Rowe, D. G. Stephenson, R. A. S. Mansel, H. T. C. Jones Vaughan, Hon. H. S. Pakington, H. G. Nicolson, R. R. Forde, G. S. Delmar Morgan, C. M. Rogers, G. V. Wellesley, W. Leith Ross, S. V. Wasbrough, R. C. Drysdale, C. N. Moore, M. W. Payne, G. R. L. Adlercron, A. F. Marsham, E. D. Hamilton, A. H. S. Synge, C. A. Lucas, E. J. Corse Scott, A. Henderson, V. T. R. Ford, J. R. L. Heyland, A. D. Grimké Drayton, O. E. Wynne, R. W. Jones, H. H. Harter, H. T. Lubbock, K. G. V. Murray, L. de S. Bencke, were elected Associates.

In accordance with notice given at the previous meeting it was proposed by the President and agreed that in Rule 3 "Middle Second" should be substituted for "Upper Second."

G. K. Allen and H. O. O'Hagan were elected to serve on the Committee for the term.

At a Committee Meeting, J. H. Crofton was elected a Member.

Saturday, March 24th.

At a P.B.M. the Presidennt gave notice that he would move the following alterations in the Rules in order to allow of the formation of a Field Club Section.

Rule 33. After "Section" to insert "A Field Club Section and an Arts Section"

Rule 34. For "Photographic" read "each."

Rule 35. For "Director of the Photographic Section" read "Directors of the Sections."

Rule 36. For "Photographic Section" read "Sections."
For "its" read "their" in both places.

Omit rules 38, 39, 40.

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Tuesday, May 15th.

At a B.P.M., the alterations in the rules of which notice had been given at the previous meeting were agreed to.

The Rev. H. Purefoy FitzGerald was elected Director of the Field Club Section.

The Secretary and Treasurer were elected Judges for the Pender Prize.

S. V. P. Weston and G. K. Allen were elected to serve on the Committee for the Term.

The following were elected Associates: D. L. Ingpen, L. V. Heathcote, C. E. Bryant, M. C. Baldwin, R. S. Ellis, H. P. L. Landeshut, J. D. Thiele, C. T. Witt, H. K. Shaw, A. H. Perrott, T. R. Newcomen, D. K. McLeod, C. T. Brookes, J. W. Best, P. H. H. Bailey, J. M. Birch, R. C. Faulconer, A. S. Watson Taylor, R. C. Trench, J. P. Francis, H. B. Craft, L. M. Heath, H.H. Prince Alexander of Battenberg, R. G. Dainty, R. R. de C. Grubb, F. H. Huleatt, P. G. Scarlett, W. C. K. Megaw, V. N. R. C. Donnithorne, L. T. R. Ridley, R. Munday, A. A. Forde, C. E. Herbert Stepney, U. E. C. Joseph.

At a Committee Meeting, A. Hippisley, R. Lascelles, J. C. F. Royle, T. R. M. Carlisle, R. F. W. P. Higgens, were elected Members.

Friday, June 1st.

At a P.B.M., C. N. F. Broad, C. C. Lister, V. A. Jackson, E. Corse Scott, C. E. Pierson, C. W. Christie, J. J. Kirkpatrick, A. K. Robertson, W. Leith Ross, C. H. Hone, H. S. L. Scott, P. K. Wise, H. S. Gladwin, G. S. Russell Pavier, R. A. Reid, A. C. de Clermont, J. E. Murray, J. M. Lambert, H. M. Charter, B. L. Curtis, E. V. Eardley Wilmot, E. W. Gower, C. E. Bentall were elected Associates.

Monday, October 1st.

At a P.B.M., votes of thanks were passed to R. W. Hopkins and F. Buckley, the late Secretary and Treasurer, who had both left.

S. P. V. Weston was elected Secretary.

E. S. G. Wickham was elected Treasurer.

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G. K. Allen, R. F. W. Higgens were elected to serve on the Committee for the Term.

F. A. Nicolson was elected Secretary of the Photographic Section.

The following were elected Associates: R. H. R. Stewart, H. R. Moore, L. R. Hill, C. T. D. Berrington, A. W. M. Jesson, H. E. W. Berkeley Hill, R. B. Morton, T. M. Crawford, E. J. Corse Scott, C. N. Moore, W. Ameer Ali, R. J. F. Sulivan, E. R. Wood, R. H. H. Moore, J. Buchanan, P. Wilson, S. Cotton, C. J. S. Hallett, K. W. Lee, M. D. Vigors, G. Jeffreys, G. B. Vernon, J. N. Guthrie, H. B. Archdale, E. L. G. Byrom, A. D. Thompson, C. E. H. Davies, C. F. K. Carfrae, A. T. G. Beckham, A. R. Forsyth.

At a Committee Meeting, F. A. Nicolson, J. N. Simonds, F. H. Beaufort, G. E. Tallents, J. F. Mott, N. C. B. Furlong were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus chosen by the winner, subject to the approval of the President.

The winner may, if he chooses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any Branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President and obtain his sanction before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

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In cases of equality between two essays, one on some branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1900 was awarded to G. K. Allen for an Essay on "Flint Implements." An abstract of the Essay is given on pages 19, 20.

Lepidoptera and Insect Prizes.

The President offers a yearly prize, value £1, for the best collection of either Lepidoptera or Coleoptera, not being a combined collection of both, made by a Member or Associate during the year ending in July. The specimens must have been found in the neighbourhood, they must have been caught or bred and also set by the competitor himself; they should, as far as possible, be named by him. The Society offers a second prize, value 10s.

The first prize for 1900 was awarded to C. T. Brookes. The second prize was not awarded.

Mr. Bevir also offered a prize open to the whole Middle School for the best collection of all insects, except dragon-flies, made by any one collector during the year ending in July, 1900.

The prize was awarded to R. R. de C. Grubb; *proxime accesitt*, G. O. Ramsbottom.

Photographic Prizes.

Mr. Kempthorne offers a yearly prize, value £1, to Members of the Photographic Section. The conditions may vary from year to year.

The prize for 1899 was for the best photograph considered as a picture. It was awarded to N. C. B. Furlong; *proxime accessit*, J. Buchanan. Honourable Mention, F. A. Nicolson, L. H. Green, H. R. Moore, A. Henderson, E. L. G. Byrom.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·89	50·7	33·5	52·0	35·9	34·6	88	10	·55	S. W.
2	·52	50·9	33·4	63·1	50·2	50·2	100	10	·04	S.
3	·27	47·2	41·4	90·5	43.7	42·7	92	10	·20	S.
4	·59	41·2	39·5	80·5	40·2	38·7	88	10	trace	S.W.
5	·85	39·4	35·3	50·0	38·1	37·1	91	10		N.E.
6	·97	42·2	26·6	57·3	32·2	31·6	91	10	·63	S.
7	29·72	43·9	31·5	73·4	40·6	39·9	95	10	·02	N.
8	30·11	51·1	30·8	81·9	41·7	41·1	95	10	·06	S.W.
9	·06	43·9	41·0	81·7	42·4	41·9	96	8	·03	N.W.
10	·17	44·1	34·6	79·2	39·9	38·5	88	10		N.W.
11	·40	39·2	30·3	51·8	32·4	31·8	91	10		S. W.
12	·36	39·7	30·3	73·1	32·3	31·8	93	2		S.E.
13	30·23	38·6	27·0	72·6	30·9	29·4	79	5		S.E.
14	29·96	41·5	25·6	72·1	27·9	27·0	82	5	·06	S.E.
15	·53	47·9	27·1	51·8	41·4	41·4	100	10	·18	S.W.
16	·42	46·2	35·8	68·3	41·1	41·1	100	10	·46	S.
17	·53	50·9	35·3	84·5	42·4	42·4	100	10	·02	S.W.
18	29·86	45·1	34·8	82·7	37·9	35·3	78	3	trace	N.W.
19	30·22	48·7	29·3	82·9	38·9	38·6	98	10	·24	S.
20	·17	43·7	37·4	57·5	40·9	40·9	100	10		S.W.
21	·14	49·9	24·0	51.2	34·1	34·1	100	10	·22	S.
22	·06	49·5	33·3	81·7	41·9	40·7	90	10		S.W.
23	30·10	50·4	41·4	58·1	48·6	46·9	88	10	·02	W.
24	29·76	52·4	44·7	67·4	47·7	46·2	89	10	.02	S.W
25	30·25	50·2	39·5	85·2	42·1	39·7	81	0	trace	N.E.
26	30·19	49·9	40·0	54·8	47·1	45·5	88	10	.01	S.W.
27	29·64	47·5	33·5	78·2	37·4	36·1	88	10	.03	N.E.
28	·24	36·9	31·0	71·3	33·4	32·8	92	10	.11	E.
29	·70	38·9	32·6	82·4	35·7	34·2	86	8	trace	N.
30	·64	39·1	35·3	42·6	36·2	35·0	89	10		N.E.
31	29·76	39·9	35·3	52·5	36·7	35·4	88	10		N.E.
Mean	29·88	45·4	33·9	68·5	39·1	38·1	91	8·7	Total 2·90	
Mean for 18 years	29·96	43·0	32·2	64·0	37·4	36·5	90	8·3	2·05	

FEBRUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/°	0—10	In.	
1	29·66	40·7	31·1	47·8	32·7	32·0	90	10		N.E.
2	·64	40·2	29.9	47·2	32·9	32·6	96	10	·65	E.
3	·72	39·6	31·3	38·2	32·7	32·6	98	10	.04	N.E.
4	·65	35·3	31·8	88·6	32·9	32·8	98	10		N.E.
5	·55	35·5	29·3	76·6	33·3	33·0	96	10		N.
6	·68	37·2	30·8	87·6	33·5	32·0	83	0		N.E.
7	·83	37·4	15·8	80·7	24·7	23·9	78	0		N.E.
8	·90	32·4	11·1	81·0	20·7	20·5	93	0		N.E.
9	·92	36·9	7·8	83·7	21·1	20·9	93	0		N.E.
10	·69	37·1	17·8	58·9	29·1	29·0	98	10	.30	S.
11	·18	35·7	28·4	89·1	31·2	29·8	80	10		N.E.
12	·44	38·9	17·0	66·4	30·1	30·0	98	10		E.
13	·72	36·5	16·6	54·8	27·3	26·9	91	10	·63	N.E.
14	·78	38·2	26·4	85·2	32·7	32·6	98	10	·17	N.E.
15	·19	47·1	27·9	82·5	35·2	35·0	98	10	·77	S.E.
16	·19	48·1	34·8	85·5	42·9	39·7	76	0	·06	S.E.
17	·21	47·4	40·2	64·1	46·2	43·9	83	10	·08	S.
18	29·29	50·9	34·0	96·9	38·6	37·5	90	8	·19	S.W.
19	28·73	50·9	37·8	83·0	49·9	49·7	99	10	·12	S.W.
20	28·77	46·9	36·3	87·0	45·7	42·4	77	10	trace	S.W.
21	29·49	48·9	30·5	87·3	38·1	34·0	68	0	·04	S.W.
22	·36	54·2	34·5	93·9	48·2	47·2	92	5	·12	S.W.
23	·51	57·1	41·2	90·3	49·9	49·5	97	10	·13	S.W.
24	·68	54·7	49·3	65·1	51·9	51·5	97	10	·62	S.
25	·76	53·4	47·9	92·3	50·2	50·2	100	10	·13	S.W.
26	·56	56·9	42·5	90·0	47·4	47·3	99	10	·15	S.
27	·48	58·0	44·5	58·6	47·4	47·2	99	10	·21	N.E.
28	29·82	41·9	39·8	81·2	40·6	40·2	97	10		N.E.
Mean	29·51	44·2	30·9	76·6	37·4	36·6	91	7·6	Total 4·41	
Mean for 18 Years	30·01	45·6	32·4	74·8	38·1	36·9	89	7·7	1·85	

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MARCH.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	%	0—10	In.	
1	30·12	43·1	35·3	91·4	38·5	35·0	72	10	·01	N.E.
2	·23	43·9	26·6	53·8	37·1	36·1	91	10		N.
3	·17	42·7	35·1	54·5	38·0	36·6	87	10	·01	N.E.
4	·09	41·1	33·5	83·8	35·9	35·0	92	10		N.E.
5	·13	40·7	34·5	52·3	38·1	37·9	98	10		N.E.
6	·25	40·2	35·6	50·0	37·9	37·1	93	10		N.E.
7	·25	41·1	33·3	73·5	36·2	35·0	89	10		N.E.
8	·20	43·7	35·6	80·5	39·1	38·2	92	10		S.E.
9	·15	51·5	35·5	89·1	43·1	39·9	70	6		S.E.
10	·23	59·8	36·5	99·5	48·1	45·2	80	0		S.
11	·20	51·1	35·3	83·6	41·4	40·2	90	10		N.E.
12	·40	56·2	29·4	98·4	45·9	40·1	62	0		N.
13	·44	56·7	37·6	81·4	45·9	43·1	81	10		N.E.
14	·54	51·7	31·3	94·6	46·2	43·1	78	8		N.E.
15	30·15	51·7	41·2	81·7	45·9	42·6	76	6		S. W.
16	29·55	43·2	36·8	78·7	39·9	34·3	60	8		N.W.
17	·47	41·2	22·5	92·1	34·1	31·0	70	5	·01	N.W.
18	·45	40·9	20·0	82·5	34·7	32·3	76	0	·24	S.
19	·22	47·7	32·5	94·2	38·1	37·9	98	6	·06	S.
20	·58	52·1	33·3	98·0	46·1	41·5	68	5		S.W.
21	·74	48·4	28·6	89·6	45·1	41·2	72	10	·35	N.E.
22	·45	46·7	37·4	49·2	42·4	41·2	90	10		N.E.
23	·77	40·9	39·2	52·2	40·7	39·1	87	10		N.E.
24	·87	39·7	33·6	51·3	38·1	35·6	79	10		N.E.
25	·89	40·9	33·3	83·2	35·9	33·1	76	10	·02	N.
26	·65	40·3	29·8	90·0	33·7	33·3	95	10		N.E.
27	·67	40·9	29·6	89·9	36·2	33·3	75	10	·33	N.E.
28	·54	41·1	32·0	81·5	38·4	38·4	100	10		N.E.
29	29·88	44·9	26·9	93·9	38·2	35·1	75	6		N.E.
30	30·03	47·9	22·5	93·3	43·1	38·1	65	3		S.E.
31	30·32	48·4	25·6	87·9	44·9	39·1	61	0		N.
Mean	29·96	45·8	32·3	79·9	40·2	37·7	81	7·5	Total 1·03	
Mean for 18 years	29·90	49·2	32.9	90·1	41·1	39·2	84	7·1	1·64	

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APRIL.

Date	Barom. Reduced	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	30·24	49·6	25·7	104·4	41·6	38·4	76	4		S.
2	30·06	49·2	27·9	89·4	42·4	39·6	78	0		S.E.
3	29·74	53·7	31·8	98·8	46·2	45·1	92	6	·30	S.W.
4	·33	56·1	39·7	103·0	50·9	47·8	79	8	·07	N.W.
5	·57	49·9	37·5	98·0	43·7	42·2	88	10	·05	N.
6	·88	53·5	30·1	104·8	48·1	41·4	59	6	·01	N.
7	·68	47·9	36·8	83·0	44·9	43·4	88	10	·02	N.E.
8	·87	48·1	34·6	85·0	43·1	40·2	78	8		N.
9	·70	54·4	28·6	92·9	47·4	42·9	70	0		S.W.
10	·77	56·2	36·5	106·2	49·7	43·9	62	6	·11	S.W.
11	·67	58·0	41·7	105·0	55·9	50·8	70	8	·05	S.W.
12	·80	57·8	42·5	102·1	54.1	48·0	64	5		N.E.
13	29·71	59·0	45·2	105·3	52·1	45·9	62	8		S.W.
14	30·03	63·8	40·6	103·4	50·9	49·1	88	10		S.W.
15	29·98	53·4	48·3	95·4	52·1	50·3	88	10		S.W.
16	29·89	56·4	38·6	103·8	46·3	43·9	82	10	·05	S.W.
17	30·23	52·3	36·3	92·9	46·7	44·1	81	10	·07	S.W.
18	·34	62·4	38·4	104·1	50·9	46·2	70	0		N.W.
19	·54	68·1	43·4	104·3	57·3	50·5	62	0		S.W.
20	·51	70·2	40·2	111·7	58·6	51·2	59	0		S.
21	·38	75·1	36·8	115·5	63·9	55·0	56	0		S.W.
22	·24	72·9	40·8	116·5	59·7	52·7	62	0		W.
23	·16	62·8	45·1	106·1	46·7	45·1	88	10		N.W.
24	·04	62·8	41·7	109·7	54·9	49·3	67	8		N.W.
25	·00	63·0	42·4		44·0	43·1	93	10		N.E.
26	30·17	54·1	25·4	Thermometer broken.	46·1	39·7	59	8		S.E.
27	29·99	51·1	30·3		49·2	44·9	72	10		N.
28	30·10	55·2	38·4		45·5	39·9	63	5		N.E.
29	29·87	56·9	31·5		51·2	45·7	65	8	·10	S.W.
30	29·80	56·9	49·1		51·7	51·3	97	10	·10	S.W.
Mean	29·98	57·7	37·5	101·7	49·9	45·7	74	6·3	Total ·98	
Mean for 18 years	29·88	55·8	36·8	100·0	47·6	44·3	78	7·0	1·39	

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MAY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/₀	0—10	In.	
1	29·99	60·8	43·4		54·2	47·0	58	3		S.W.
2	·97	63·8	39·5		57·4	50·3	60	6	·08	W.
3	·45	59·0	42·5		49·4	49·2	99	10	·22	S.E.
4	·98	63·1	48·4	Thermometer broken.	55·9	50·3	67	10		S.E.
5	·87	65·2	48·1		63·1	55·8	62	5		N.E.
6	·71	65·1	44·8		54·9	53·2	89	10	·07	N.W.
7	·61	63·8	49·3		57·5	52·8	72	6		N.W.
8	·66	61·8	36·5		59·4	55·3	76	10	·03	N.W.
9	·59	57·8	47·6	100·2	51·6	44·9	59	10	.04	N.W.
10	29·93	54·9	46·3	108·4	47·9	47·9	100	10		N.E.
11	30·04	57·8	35·1	106·7	54·7	49·8	70	4		S.E.
12	·04	54·6	42·4	100·4	48·2	45·2	79	10	.01	S.
13	·00	49·9	39·8	102·9	46·3	41·4	67	8		N.E.
14	·01	54·4	35·8	122·2	48·4	41·2	56	8		N.E.
15	·07	56·9	35·8	112·9	50.1	43·3	58	8		N.E.
16	·12	56·9	30·1	116·1	52·2	45·9	62	6		N.E.
17	·22	64·1	40·7	113·9	49·2	44·4	68	3		N.E.
18	·08	55·9	40·4	112·1	52·2	49·2	80	10		N.
19	·06	58·0	40·4	113·9	49·1	41·7	55	10		S.
20	30·11	64·8	35·8	125·4	52·7	51·0	89	2		S.W.
21	29·97	60·8	44·4	113·1	59·1	54·2	72	10	·15	S.W.
22	·65	58·1	52·2	115·1	53·9	53·8	99	10	.40	S.W.
23	·65	60·0	47·3	115·1	55·9	52·2	77	10	.30	S.W.
24	29·68	59·1	45·1	120·9	51·5	50·5	93	10	·10	S.W.
25	30 00	59·0	39·2	119·4	54·5	49·2	68	8		W.
26	·23	62·5	37·0	117·7	51·2	48·5	81	10		E
27	·24	68·1	39·7	124·1	58·1	53·8	74	2		S.W.
28	·23	66·3	51·3	128·2	59·7	55·7	76	8		S.W.
29	·33	63·8	41·5	119·2	61·1	53·0	58	5		S.W.
30	·33	59·4	43·4	121·9	54·5	50·5	75	6		N.
31	30·33	55·9	46·1	103·9	49·4	47·2	85	10	.08	N.E.
Mean	29·97	60·1	42·3	114·5	53·7	49·3	74	7·7	Total 1·48	
Mean for 18 years	29·96	61·8	42·6	108·7	54·0	49·8	75	6·8	1·71	

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JUNE.

Date.	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	%	0—10	In.	
1	30·26	55·5	46·4	101·9	48·5	48·0	96	10	·15	N.E.
2	30·16	61·3	45·4	110·4	51·9	51·5	97	10	trace	N.E.
3	29·98	69·4	50·0	124·1	58·3	55·6	84	5		N.E.
4	30·28	74·9	44·7	126·4	68·1	61·1	65	8		N.E.
5	29·96	66·0	42·7	117·9	55·9	52·0	76	10		N.
6	·96	73·4	41·5	119·9	62·2	54·8	61	4	·09	S.W.
7	·89	65·1	50·2	127·1	60·9	55·8	71	8	·21	S.W.
8	29·86	66·1	49·5	116·9	55·9	54·5	90	8	trace	S.W.
9	30·06	71·4	51·8	120·6	60·7	56·0	73	10		S.W.
10	29·90	79·1	49·1	129·4	70·2	61·6	59	2		S.W.
11	·88	84·4	52·8	138·6	71·6	64·4	64	8		S.W.
12	·93	82·4	55·2	133·4	71·9	65·9	70	2	·36	S.W.
13	29·94	66·8	54·3	128·8	58·4	54·6	77	10		S.E.
14	30·11	64·8	47·3	106·5	62·4	56·2	66	8	·23	S.W.
15	·02	66·0	53·0	117·4	59·4	59·2	99	10	trace	S.W.
16	·09	66·3	52·2	113·3	61·9	57·9	77	10	·03	S.W.
17	·09	70·1	57·0	120·9	60·1	56·7	85	10		W.
18	30·13	70·9	44·9	132·0	64·9	57·0	59	5		N.W.
19	29·96	69·9	51·6	132·3	64·7	56·9	59	3	·03	S.W.
20	·79	68·9	53·0	128·0	65·2	58·1	63	10	·20	S.W.
21	·81	62·1	50·0	118·1	55·4	55·0	97	10	·28	S.
22	·91	66·1	49·7	126·4	61·2	55·2	67	8	·35	S.
23	·84	65·3	44·6	127·2	54·9	50·8	74	8		N.W.
24	·97	61·3	47·9	104·9	59·9	54·7	70	10	·30	W.
25	·43	61·8	43·5	112·7	54·1	54·1	100	10	·19	W.
26	29·91	63·8	51·3	114·1	56·1	52·3	76	10		S.W.
27	30·05	63·1	43·4	121·5	58·2	53·5	73	8		N.
28	·05	67·1	49·3	123·9	60·2	57·0	81	10		N.E.
29	30·08	70·4	49·1	128·1	66.2	58·2	60	5	·21	N.W.
30	29·75	65·2	52·0	121·1	62·2	58·1	76	10	·01	S.W.
Mean	29·97	68·0	49·1	121·5	60·7	56·2	75	8·0	Total 2·64	
Mean for 18 years	30·06	68·5	47·6	116·2	60·2	55·7	75	6·9	1·68	

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JULY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/₀	0—10	In.	
1	29·68	63·8	54·7	131·0	61·4	55·8	69	5	·06	W.
2	·68	62·8	53·5	120·4	57·7	56·2	90	10	·05	S.W.
3	29·80	66·1	51·0	126·9	61·7	58·2	80	10	·08	S.W.
4	30·16	69·1	47·9	128·6	60·9	56·0	72	8	·03	S.W.
5	·04	74·1	52·2	127·0	60·9	58·7	86	10	·02	N.W.
6	·02	66·8	52·2	127·4	57·7	53·5	75	10	trace	N.W.
7	·15	62·5	48·1	121·9	55·1	50·8	73	8		N.E.
8	·25	64·0	40·7	123·2	57·4	51·6	67	4	·01	N.E.
9	·25	70·9	52·0	132·0	62·2	57·9	76	10		S.W.
10	·17	80·9	48·1	130·6	70·2	61·1	57	0		N.W.
11	30·01	82·1	51·3	133·9	77·1	67·6	58	4		S.
12	29·80	80·4	60·6	132·3	77·9	67·8	56	5		S. W
13	·86	79·7	54·0	131·6	73·9	67·0	66	2	trace	S.W.
14	29·97	72·7	56·0	124·7	67·5	62·4	73	8		S.W.
15	30·13	78·1	49·1	137·8	66·9	61·6	71	5		S.W.
16	·09	88·0	54·0	140·6	76·7	71·0	71	10		S.
17	·28	80·4	53·9	137·0	70·9	62·9	61	0		N.W.
18	·25	83·7	52·8	131·6	75·7	67·0	61	0		N.W.
19	·07	89·2	48·6	134·8	80·5	70·1	55	0		S.E.
20	·03	84·9	61·7	135·6	81·4	75·0	70	0		S.E.
21	·15	73·9	58·6	122·3	69·1	65·7	81	10		S.
22	·19	77·9	59·9	138·0	67·2	65·1	88	10		N.W.
23	·19	81·7	64·9	136·0	73·1	67·3	70	8		N.W.
24	30·12	85·4	58·3	138·8	79·2	71·6	65	8		S.W.
25	29·97	90·0	57·1	139·0	81·2	70·3	54	0		S.W.
26	30·08	77·9	59·1	139·6	72·4	67·1	73	6		N.E.
27	30·08	80·5	56·0	152·8	71·1	66·1	74	8	·27	S.E.
28	29·80	75·7	57·3	125·4	63·1	63·1	100	10		S.E.
29	·82	71·7	55·5	127·8	64·3	59·9	75	10	trace	S.W.
30	29·92	72·9	55·0	136·6	67·1	59·7	62	8		N.E.
31	30·10	75·7	54·2	130·6	70·2	64·7	72	8	·18	S.E.
Mean	30·04	76·2	54·1	131·5	68·8	63·0	71	6·3	Total ·70	
Mean for 18 years	29·98	70·6	51·2	118·0	62·7	58·3	76	7·0	2·24	

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AUGUST.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·91	73·9	54·2	128·3	60·3	56·5	77	10	·22	S.E.
2	·82	70·9	52·3	127·3	62·9	62·7	99	10	·15	S.W.
3	·45	70·7	57·3	122·7	61·9	60·7	93	10	·21	S.W.
4	·73	63·3	51·0	127·0	58·6	52·3	64	5	trace	N.W.
5	·79	60·2	46·8	92·2	56·2	52·2	75	10	·03	W.
6	·60	62·1	49·6	113·4	57·1	56·8	98	10	·24	S.W.
7	·60	66·8	52·0	135·4	59·9	56·4	79	8	·06	W.
8	·93	63·6	50·3	125·7	57·1	55·8	91	10		W.
9	·88	59·3	50·5	87·7	57·1	54·7	85	10	·27	W.
10	29·94	61·4	51·8	118·1	57·6	54·0	78	10	trace	N.W.
11	30·36	75·4	44·5	120·9	60·7	57·1	78	0		N.W.
12	·36	76·9	51·4	126·9	69·4	60·2	57	0		S.W.
13	·44	80·4	50·2	131·0	72·4	61·3	51	2		S.W.
14	·41	79·9	49·3	127·8	72·1	64·1	61	0		N.
15	·34	70·7	53·3	116·4	66·1	60·4	70	8		N.E.
16	·14	75·1	51·7	124·2	68·9	61·1	61	2		N.E.
17	·04	76·9	58·1	129·0	62·7	60·7	88	10		N.E.
18	·02	82·3	57·6	136·1	74·4	68·0	68	0		N.W.
19	30·01	75·9	51·0	134·8	61·9	58·4	80	4		S.W.
20	29·87	72·9	41·8	129·1	64·9	60·4	76	0	·60	S.W.
21	·72	69·1	53·4	121·9	64·2	59·9	76	5	·76	W.
22	·51	66·2	55·8	126·9	61·5	56·3	71	5	·34	S.W.
23	·66	64·6		121·2	54·1	53·8	98	9	·05	S.W.
24	·72	69·5	51·0	124·5	63·2	58·3	73	9		S.W.
25	29·91	68·1	44·4	134·3	63·4	58·7	74	5	·10	W.
26	30·09	63·8	51·8	113·9	55·9	49·2	62	10		N.W.
27	·01	58·6	50·8	84·4	57·9	55·0	83	10	·06	N.E.
28	·18	62·0	54·2	94·1	58·2	54·8	80	10		N.E.
29	·35	66·9	54·2	99·9	58·3	57·4	94	10		N.E.
30	·40	67·4	52·5	118·7	62·1	57·1	72	3		S.W.
31	30·34	72·9	52·0	127·6	64·9	61·2	79	4	·27	S.W.
Mean	29·98	69·3	51·8	120·0	62·1	57·9	77	6·4	Total 3·36	
Mean for 18 years	29·95	70·2	50·9	117·5	62·1	58·2	77	6·8	2·09	

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SEPTEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/°	0—10	In.	
1	30·09	67·2	55·6	92·4	62·9	62·9	100	10	·02	S.W.
2	·09	61·3	48·9	132·0	55·9	54·5	90	10		S.W.
3	·42	60·4	41·2	136·6	53·9	49·2	71	10		N.E.
4	·44	63·8	37·0	115·1	58·9	53·5	69	0		N.E.
5	·26	69·9	41·2	120·9	61·2	56·2	72	2		N.
6	30·21	72·0	38·7	120·0	61·3	55·2	67	4		N.
7	29·90	73·7	45·1	130·3	65·9	56·2	53	8		N.W.
8	30·00	68·9	43·7	120·9	63·9	58·5	70	3		N.W.
9	·06	69·4	48·1	126·1	62·8	58·2	74	4		S.E.
10	·16	69·4	46·9	128·8	62·9	56·3	64	8		S.E.
11	·41	66·0	41·5	123·9	60·2	54·6	68	0		N.E.
12	·43	69·1	39·2	116·1	60·9	57·1	77	0		N.E.
13	·48	69·1	38·7	111.9	63·7	58·1	69	8		S.W.
14	·41	67·5	45·0	120·9	60·9	55·6	70	10		S.E.
15	·20	71·9	51·5	115·1	60·5	57·4	82	10		S.E.
16	·12	77·2	54·3	125·1	61·5	60·7	95	10		N.E.
17	.15	72·7	55·2	126·9	60·4	59·4	93	10		S.E.
18	·02	70·1	54·0	115·1	58·9	58·2	95	0		S.
19	·20	69·3	39·4	124·9	61·1	53·5	60	4		N.W.
20	·38	69·1	38·4	121·2	60·2	53·5	63	5		S.W.
21	·39	72·9	43·0	125·5	63·7	55·5	58	10		S.W.
22	·31	69·2	53·8	116·9	61·7	59·7	88	10		S.W.
23	30·21	73·1	56·0	123·1	60·1	58·6	91	6		S.W.
24	29·79	67·4	51·3	106·7	66·4	61·3	73	5		S.W.
25	30·01	62·8	38·4	120·1	56·1	50·8	69	4		N.E.
26	30·09	64·3	44·5	114·9	62·4	56·2	66	10	·20	S.
27	29·65	61·1	54·8	110·4	58·9	58·4	97	5	·23	S.
28	29·65	62·3	50·3	114·9	60·2	55·5	73	2		S.W.
29	30 01	64·0	43·2	114·4	59·1	55·0	76	2		S.W.
30	29·71	59·6	44·2	107·2	58·6	54·8	77	7	·17	S W.
Mean	30·14	67·8	46·1	119·3	60·8	56·5	76	5·9	Total ·62	
Mean for 18 years	30·08	69·5	50·4	108·8	61·5	58·4	87	7·3	2·08	

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OCTOBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·92	61·8	37·7	117·1	58·1	51·2	62	10		W.
2	·87	63·0	46·4	117·7	60·1	55·5	73	8		S.W.
3	·93	58·8	44·2	113·2	51·2	46·2	68	5		S.W.
4	·79	59·8	38·2	106·4	58·1	55·2	83	10	·45	S.W.
5	29·84	62·8	42·2	103·9	58·9	52·2	63	8	·12	S.E.
6	30·04	65·5	51·3	115·1	61·5	57·7	78	8	·02	W.
7	·25	67·4	55·8	119·1	61·1	58·1	82	7		S.W.
8	·23	70·1	50·6	117·1	63·1	61·7	91	10		S.W.
9	·21	70·9	48·9	113·9	63·9	60·7	81	4		S.W.
10	·18	55·9	52·2	112·1	55·4	52·3	80	10	trace	S.W.
11	·18	59·8	33·3	110·9	50·1	47·4	81	0		N E.
12	30·05	60·1	35·5	107·1	54·3	48·2	63	0		N.
13	29·87	55·3	40·2	104·2	53·4	49·3	71	10	·02	S.W.
14	·72	50·9	41·9	115·3	45·1	41·7	76	3		N.W.
15	·81	51·1	36·5	108·5	47·9	42·6	66	0		N.W.
16	·95	54·9	30·5	106·9	47·9	43·5	71	10	·07	N.W.
17	·75	61·8	46·9	113·9	54·7	54·6	99	10	trace	S.W.
18	29·88	55·9	46·4	97·9	55·2	50·2	69	8		S.W.
19	30·14	53·9	44·0	95·1	50·7	47·5	78	8		N.
20	·30	49·9	41·6	92·9	46·7	44·7	85	10		N.E.
21	·24	49·5	35·6	100·2	42·2	41·4	94	0		N.
22	·44	54·1	33·0	97·9	43·9	41·6	83	10	·05	N.
23	·37	56·2	36·8	94·9	52·9	52·5	97	10	trace	N.
24	30·31	59·8	45·4	94·7	54·1	53·2	94	10	·05	N.W.
25	29·81	56·1	51·5	68·8	54·1	52·0	86	10	·15	S.W.
26	·32	56·0	42·4	97·9	45·4	43·9	88	10	·09	S.W.
27	·46	54·7	37·1	100·4	49·9	45·4	71	10	·01	N.W.
28	·84	53·9	36·5	95·2	44·4	42·6	86	5	·24	S.W.
29	·69	55·1	43·9	101·0	53·5	50·0	78	2	·52	S.W.
30	·87	59·8	46·1	98·6	49·1	49·1	100	10	·11	S.W.
31	29·97	62·8	48·4	106·9	59·5	58·1	90	6	·12	S.W.
Mean	29·97	58·3	42·6	104·7	53·1	50·0	80	7·2	Total 2·02	
Mean for 18 years	29·91	56·2	40·8	93·0	49·0	47·2	88	7·1	3·00	

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NOVEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/₀	0—10	In.	
1	29·86	63·0	52·5	102·9	58·1	57·0	92	8	·09	S.W.
2	30·16	54·9	50·4	92·9	51·7	51·7	100	10	trace	N.W.
3	·21	55·5	50·0	92·1	52·1	51·5	96	10	·01	N.W.
4	30·05	52·3	48·8	77·4	50·4	50·3	99	10	·12	S.
5	29·84	55·5	43·2	72·8	49·7	49·7	100	10	·05	S.W.
6	·50	55·1	49·2	72·6	52·7	52·7	100	10	·16	S.W.
7	·42	50·2	46·3	83·1	48·5	46·7	87	10	·05	N.W.
8	·93	54·9	36·6	101·2	49·1	44·4	69	3	·04	S.E.
9	·71	52·4	48·3	98·1	52·4	48·4	74	10	trace	W.
10	·68	49·7	35·1	96·6	45·2	41·6	74	2		N.W.
11	·79	46·1	24·8	92·5	34·7	33·3	85	0	·08	W.
12	·80	55·1	32·6	81·1	44·9	44·4	96	10	·11	S.W.
13	·61	54·9	44·5	80·2	54·9	53·8	93	10	·04	S.W.
14	·61	48·9	40·0	79·9	48·1	47·2	93	8	·15	S.W.
15	·37	53·1	38·2	94·9	48·7	48·5	99	10	·19	S.W.
16	·11	47·1	38·4	93·9	46·1	45·7	97	10	·18	S.W.
17	29·71	48·2	42·2	92·4	45·1	44·2	93	10	·03	S.W.
18	30·14	44·9	33·3	76·6	41·1	38·7	81	7		N.E.
19	·26	45·2	37·4	91·7	41·9	38·4	74	5		N.E.
20	30·02	44·4	34·9	86·9	41·4	40·7	95	10		N.E.
21	29·78	45·9	38·2	56·5	44·1	42·9	90	10	·01	N.E.
22	·78	46·1	39·7	84·1	42·9	41·4	88	8		S.W.
23	·72	47·7	31·6	79·9	45·1	42·9	77	2		S.
24	·69	48·5	29·3	79·5	41·1	41·1	100	8	·32	S.
25	·39	51·9	40·4	83·2	46·6	46·3	98	2		S.W.
26	·68	52·5	40·2	92·1	47·2	46·2	92	5	·03	S.
27	·55	52·9	39·7	93·5	46·2	43·9	83	0	·17	N.W.
28	·65	47·1	39·4	87·4	45·1	45·1	100	10	·20	S.
29	·15	46·1	41·5	73·8	43·7	43·7	100	10	·06	S.
30	29·67	46·3	36·6	79·1	42·2	41·7	96	6	trace	N.W.
Mean	29·73	50·5	40·1	86·3	46·7	45·5	91	7·5	Total 2·09	
Mean for 18 years	29·95	49·7	37·5	75·3	43·7	42·6	92	8·0	2·70	

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DECEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In	°	°	°	°	°	°/°	0—10	In.	
1	29·68	42·9	38·4	78·9	40·9	40·9	100	10	·03	N.
2	·74	41·1	35·6	69·1	38·9	38·4	95	10	·03	E.
3	·87	53·5	38·2	72·6	41·1	40·7	97	10	·05	S.W.
4	·62	52·5	40·5	72·0	52·1	49·0	80	10	·25	S.
5	·57	55·4	48·1	71·8	48·9	48·8	99	10	·40	S.W.
6	29·74	51·2	47·1	62·4	50·1	48·3	88	10	·06	S.W.
7	30·02	52·1	42·0	90·2	46·1	44·4	88	10	trace	N.W.
8	·16	52·7	38·4	69·6	51·9	50·2	89	10	·04	S.W.
9	·02	52·9	50·5	68·0	52·1	52·0	99	10	trace	S.W.
10	·36	50·1	33·3	88·9	39·4	39.1	97	8	trace	S.
11	·16	53·4	37·5	67·0	48·7	47·5	91	10		S.W.
12	·15	55·1	48·1	66·9	53·1	51·8	91	10	·23	N.W.
13	·00	50·1	48·4	68·0	49·4	49·0	97	10	·08	S.W.
14	·32	50·7	39·0	65·4	43·3	42·1	90	8	trace	S.W.
15	·14	52·2	42·7	87·9	50·3	47·8	83	8	·02	S.
16	·44	50·7	36·7	81·9	40·9	40·1	94	5		W.
17	·34	49·1	40·4	84·7	43·1	41·7	88	10		S.W.
18	·04	51·1	37·5	84·1	49·1	47·6	89	10	·40	S.
19	30·14	51·4	33·6	88·9	38·7	38·2	95	8	·01	S.W.
20	29·83	53·9	38·2	83·1	51·1	49·0	86	10	·22	S.W.
21	29·77	48·4	40·8	84·1	46·7	42·2	70	0	·05	S.
22	30·06	39·6	30·5	64·4	34·1	33·8	96	10	·02	S.
23	29·92	37·4	28·9	60·1	31·5	31·4	98	10		S.W.
24	30·03	50·5	29·6	58·7	35·1	35·0	99	10	·03	S.W.
25	30·02	52·7	34·7	73·1	50·4	50·3	99	10	·11	S.W.
26	29·86	58·0	44·7	84·6	46·1	45·9	99	5	·21	S.W.
27	29·48	52·5	43·2	63·7	47·7	47·4	98	10	·13	S.
28	28·97	44·5	42·0	75·2	42·4	41·2	90	10	·05	W.
29	29·68	45·7	33·3	92·1	39·7	37·1	79	2	trace	S.W.
30	·61	50·9	33·8	52·9	45·6	45·4	99	10	.70	S.
31	29·33	41·1	35·9	68·0	39·9	38·5	88	10	·06	N.
Mean	29·91	49·8	39·1	74·1	44·8	43·7	92	8·8	Total 3·18	
Mean for 18 years	29·93	44·2	32·8	63·7	38·4	37·5	91	8·0	2·32	

Total rainfall for the year, 25·86 in.

Mean for 18 years, 24·67 in.

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FIELD CLUB SECTION.

The spring of this year saw the start, or, perhaps more strictly speaking, the revival of a Field Club branch of the Society, for the purpose of encouraging Field work, in bringing together all those interested in the various Natural History branches, and more particularly to assist in thoroughly working up the flora and fauna of the district, keeping within a radius of twelve miles. The Natural History lists, which the Society published six years ago, were compiled from the records of the previous twenty years; during that time a great change came over the country just round the College, cultivation drainage and building have all aided in destroying many plants and insects that used occasionally to be found; and these lists, although interesting as bearing record as to what did occur at one time or another are now necessarily incomplete; many of the finds are no longer to be found, whilst other and new ones have to be added. To correct these must be part of the work of the Field Club Section, and it is greatly to be hoped that all who join and enjoy the benefit of it, will do something to help in the work. Each member should make during the season a complete list of the finds he has made in his own branch, and send it in to the Secretary or whoever has undertaken the work; all doubtful cases being referred to someone in authority. If this is carefully done, it will be possible to publish a good list every year in the report, which would be a really valuable source of reference. Another object the Section has before it, is the formation of a good and complete local museum; this has been started, and a few members have helped considerably, but we should like to see everyone helping; everyone interested should find out from time to time what the museum lacks, and there is no difficulty here because it lacks a great many things, and he should strive unselfishly to fill up the vacant spaces, giving at the same time all the details of the find, and date, locality and name of finder; in time the museum would then be of even more value than the lists, but every one must help and do his own share; in fact the local museum and note book should be the first object of every member of the Feld Club Section. The mention of the note book leads me to another point, and that is that the Field Club should discourage the mere collector, he who collects merely for the sake of possessing a bigger collection than someone else; now it is probable that this is nearly always the first beginning of a good field naturalist, but it should be only a beginning, and that point of view should be very short-lived; original work of some kind

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should be the aim of everyone; a mere collection of bird's eggs with no knowledge of the birds themselves, gained partly by reading but more by observation seems to be a very senseless thing, and the same applies to all branches of natural history; and the study of one branch should lead on to another, no one, for instance, can be a really good Entomologist without knowing something of the plants the insects live on; different variations should be studied, the surroundings examined for the cause of these, experiments indeed made to prove various theories and so on; to be a good field naturalist, implies a general, and in some case a special, knowledge of all common things to be seen; keep a note book then and make use of it.

In the Ornithological Section, there are one or two enthusiasts who work in this way, in the future we shall hope to find more work like this carried out.

The Field Club is open to all Members of the School. This year it was open to anyone who cared to join, the only condition being that the subscription to the N.S.S. for the summer term was paid.

By the kindness of the Master, those who joined in the big excursions were allowed to come out of school at twelve o'clock, so as to make an early start. The following kindly took charge of the various branches. Mr. FitzGerald (Botany, Shells, &c.); Mr. Wells (Lepidoptera); Mr. Elton (Coleoptera); Mr. Earle and C. M. Rogers (Birds and Eggs); Mr. Blundell (Geology).

EXCURSIONS.

June 9th.

An excursion to the Hog's Back had been arranged for June 2nd, but owing to the bad weather this was postponed for a week. The party of 43 (38 boys and 5 masters) came out of school at 12 o'clock and caught the 12.23 (S.E.R.) to Wanborough. A cart met us at the station to convey the luncheon and tea hampers to their destination, and we walked to the top of the hill above Puttenham village; lunch was eaten in the beech wood, and after this a general dispersal took place to explore the neighbourhood. Owing to the lateness of the season and a somewhat high wind the butterflies and moths were not very numerous, and it was somewhat late for birds-nesting; the botanists, of whom there were very few, were more fortunate, the chalk pit below Mr. Julian Sturgis' house, into which permission was very kindly

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given us to go, proving a most interesting spot, the finds including the following, *Potentilla argentea, Saxifraga granulata, Hippocrepis comosa, Aceras anthropophora, Orchis pyramidalis, O. maculata, O. latifolia.*

The geologists also made a few good discoveries. The party met in the park at Puttenham, where tea &c. was provided by the hostess of the "Good Intent," unfortunately she had underestimated our appetites, or perhaps the capacities of a Field Club excursion, and the supply of tea and eatables soon ran out. We then were photographed by Mr. Blundell (this unfortunately turned out a failure) and walked over the hill back to Wanborough, catching the 6.15 train home.

June 11th.

This was the Duke of York's half-holiday, and advantage was taken of it by Mr. FitzGerald and eight boys to pay a visit to the Loddon; the party boated, bathed and birds-nested and returned home after tea, but the results were somewhat disappointing in the way of "finds."

June 28th.

Her Majesty the Queen having commanded a whole holiday for the School, Mr. FitzGerald, Mr. Elton and seven boys started off in the morning by train to Shere and Gomshall, where a capital day was spent in exploring the chalk pits and neighbouring woods. We had lunch in the big chalk pit at the top of the hill where the Edible Snail (*Helix pomatia*) is always to be found; as are also two somewhat uncommon plants, Butcher's Broom (*Ruscus aculeatus*) and White Helleborine (*Cephalanthera grandiflora*). About 5 p.m. the party met for tea at the farm house in the middle of the village, where we were very well looked after and arrived home about 7 p.m.

July 14th.

Mr. FitzGerald, Mr. Elton, Mr. Wells and 23 boys drove in brakes to Hook Common, leaving the College at 12 o'clock. Mr. Blundell, Mr. Broomfield and seven geologists bicycled to the same place, and all met for lunch, the geologists arriving very late; these latter went their own way afterwards, having tea at Odiham. Lady Dorchester had most kindly given us leave to roam through Butter-wood, and every one was delighted to see large numbers of the White Admiral and the Silver-washed Fritillary butterflies. We were most hospitably entertained at tea at Greywell House by Lady Dorchester; we left there at 6.30 p.m. and arrived home some two hours later, after having spent a most enjoyable day.

H. PUREFOY FITZGERALD.

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BOTANICAL REPORT.

There was not much enthusiasm shown by the members of the Field Club this year about flowers, which seems to me to be a great pity; every one who has any pretence of being a field naturalist should try to learn, at any rate, the names of the common flowers he comes across on his exploring excursions, if it were only with a view to assisting him in knowing the food plants of caterpillars. There were only two entries for the Botany prizes; next year it is to be hoped that the influence of the Field Club will be more widely felt, and that more interest will be taken in this direction. What is wanted is for a few enthusiasts to come forward and offer to help compile lists of flowering plants, as the others can wait their turn, help in naming any plants will be most gladly given; also hints as to pressing and arranging specimens. I do not propose to give a complete list of those plants that were found during the season, but only to mention a few of the most interesting and the most uncommon; some of these, I fear, come just outside our 12 miles radius. The numbers refer to the 8th Edition of the London Catalogue. Where no locality is given the neighbourhood of Wellington College is meant.

1 Clematis Vitalba (Hook).
13 Ranunculus fluitans.
34 ,, arvensis.
43 Aquilegia vulgaris (Gomshall).
50 Nuphar luteum (Loddon).
52 Nymphæa alba (Loddon).
162 Heliànthemum Chamæcistus (Hog's Back).
222 Stellaria nemorum.
379 Hippocrepis comosa (Hog's Back).
380 Onobrychis sativa (Hog's Back).
498 Potentilla argentea (Hog's Back).
525 Pyrus Aria (Gomshall).
547 Saxifraga granulata (Hog's Back).
609 Bryonia dioica (Hog's Back).
930 Pyrola minor.

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952 Lysimachia Nummularia (Hook).
978 Gentiana Pneumonanthe (Hook).
1016 Solanum nigrum.
1171 Illecebrum verticillatum.
1340 Epipactis latifolia.
1346 Orchis pyramidalis (Hog's Back).
1355 ,, latifolia (Hog's Back).
1357 Aceras anthropophora (Hog's Back).
1386 Leucojum æstivum (Loddon).
1389 Ruscus aculeatus (Gomshall).
1464 Acorus Calamus (Loddon).

H. PUREFOY FITZGERALD.

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ENTOMOLOGICAL REPORT.

The revival of the "Field Club" this summer was hailed with great pleasure by all lovers of nature, by none more so than by the Lepidopterists. An opportunity was thus given of going further afield and of studying the fauna of other districts than our own. It is to be hoped that next year all collectors of the "wily bug" will join this branch of the Natural Science Society and will help to record the captures of any of the rarer butterflies and moths. Several useful lists of captures have already come to hand and we hope to be able to compile by the end of next year a new list of the Lepidoptera taken in the neighbourhood of Wellington College. The most noteworthy feature of 1900 was the capture of half-a-dozen specimens of the "White Admiral" (*Sibylla*) in Bishop's Copse—an insect new to our immediate neighbourhood. Thanks to the energy of the Blücher Dormitory, represented by Rogers and Brookes, and of Mr. Brougham's House in the persons of Gladwin and Lambert, we have already got the nucleus for a new list of captures, but we have decided not to publish it till another year has passed and our information has become fuller and more complete. All lists, with dates of capture and locality, will be heartily welcomed.

A very cold May made all insects very backward in coming out this year and the result of our first "Field Day" to the Hog's Back near Guildford on June 9th, proved rather a failure from an entomological point of view. It was a very windy day and there was hardly any sun. Several Orange Tips, Holly Blues, Dingy and Grizzled Shippers, were taken; also one small Blue in a chalk pit. Among the moths, *Petraria*, *Montanata*, *Maculata*, and *Candidata* were very abundant; a few specimens of the following were also boxed: *Corylata*, *Liturata*, *Plagiata*, *Falcula*, *Mi*, *Taminata*, *Temerata*, *Omicronaria*, *Crepuscularia* and one *Mendica*.

Our most successful "Field Day" was on July 14th to Hook Common and Woods, about 10 miles from here, and there we spent a most enjoyable day. *Sibylla*, the White Admiral, was abundant everywhere, while *Paphia*, the Silver-washed Fritillary was also taken but in lesser numbers. A few *Russula* (rather worn) and one *Fimbria* were also boxed. *Palumbaria* and *Cytisaria* swarmed on the heath. After a grand day's sport we were most hospitably entertained at tea by Lady Dorchester, who had kindly given us free run of her woods. We certainly hope to repeat this

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expedition next year. We intend next year to make an excursion to Swinley Woods, only about six miles from here; it is an excellent spot and a large fence all round the park yields a plentiful harvest of moths. During the warm weather in July moths were greatly attracted by light and thanks to the kindness of Messrs. Broomfield, Cave and Brown, we were enabled to secure a fine series of the following:—*Minutata*, *Porphyrea*, *Blanda*, *Cytisaria*, and *Spinula*. *Picata*, *Camelina*, *Undulata*, *P. Moneta*, *Apiciaria*, *Fascelina*, *Potatoria* and *Quercifolia* (by Mr. Moore) were also taken by this means. Even the lamps in the college quads always had their visitors in the shape of *Perla*, *Aenea*, *Didymata*, *Complana*, *Rhomboidaria*, &c., and the "Pugs" were well represented. We also owe our thanks to Professor Sidgwick, of Oxford, who has kindly sent in a list of moths he took in the College grounds last April, among which may be noted two specimens of *Rubiginea*. In conclusion, we would like to thank Mr. Bevir for the kindness he has always shewn us and for the trouble he has taken in furnishing us from time to time with specimens of moths we wanted. We hope in time to come to have a cabinet in our museum consisting of Lepidoptera caught only in the neighbourhood of Wellington College.

C. WELLS.

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ORNITHOLOGICAL REPORT.

Owing to the bad weather in the Easter term many birds were very late in nesting this year. Thanks to the formation of the Field Club, some of us have been able to have a larger beat than usual. The Snipe has been found three times in the Blackwater meadows, the latest being on June 2nd, when the nest was found with quite fresh eggs. The Barn Owl was also found nesting in a willow overhanging the Blackwater, with four eggs quite fresh on May 7th. On May 9th a Wild Duck's nest was discovered at Blackwater, with twelve eggs. The Greater Spotted Woodpecker's egg was collected by P. H. Bailey, and a Nightingale's egg by Mr. Earle on the same day at Eversley; the latter has come in much greater numbers here this year, one even nesting in the Master's garden; this bird was sitting on three eggs, when unfortunately the nest was destroyed by a cat, much I regret to say to the short sighted satisfaction of some, on account of the bird's continuing to sing after its nest was destroyed; but I fear the Master will have no more nightingales in his garden next year. The Garden Warbler has been seen more frequently, five nests being found in Bishop's Copse alone; the Willow Wren was seen in several spots round Eversley, and the Redstart appeared, eggs of the latter being found as late as June 29th. The Long tailed Tit was to be seen in several places, I found one beginning to build as early as March 19th in the Blackwater road. The Red-backed Shrike, though never common, seems to breed less and less here every year; so far as I know only one nest was found this year by A. A. Cole; the Sedge and Reed Warblers also were here in smaller numbers than usual. On June 9th the first regular excursion of the Field Club took place, the Hog's Back being the spot chosen; it is a lovely place, but not very much of interest in the bird line was noted, excepting a large number of Turtle Doves. Mr. Fitzgerald very kindly took some of us to the Loddon, where we found a Black-headed Bunting; and a fine specimen of a Cuckoo's egg was discovered by a member of Mr. Blundell's party to the same place. On July 1st a Kingfisher was seen at the bathing lake.

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The following eggs have been given to the local egg collection ; the names of donors are also given : —

1 Sparrow hawk (Mr. Bevir).
1 „ „ (H. Symons).
1 Kestrel hawk (H. S. Gladwin).
1 Sedge warbler „
1 Black cap „
1 Butcher bird (A. A. Cole).
1 Tree pipit „
1 Nightingale (Mr. Earle).
1 Redsart (H. Carter).
1 Redstart (C. M. Rogers).
1 Sky Lark „
1 Plover „
1 Willow wren „

C. M. ROGERS.

Mr. Davenport sends the following notes :

March	28.	Black bird's egg found in the Master's garden.
April	16.	First swallow.
„	22.	Cuckoo first heard.
„	„	Nightingale first heard.
Oct.	26.	Last Swallow seen near Wokingham.

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GEOLOGICAL REPORT.

On May 26th a small party bicycled over to the Hog's Back to find the best chalk pits for the next N.S.S. field day. In the first pit examined on the north of the main road a few fragments of Micraster and Terebratula only were found. Passing to the south side of the ridge we rode towards Guildford, turning off now and then to examine the various pits on the escarpment on our left. We found, however, few fossils, mainly Terebratula and Rhynconella. Before reaching Puttenham the small exposure of Lower Green Sand near the road was examined. After tea at the village, the party again crossed the Farnham-Guildford road, and examined the pits on the road to Wanborough, finding a few Echinus spines and a Holaster. After leaving this we made direct for Wellington, through Ash and Frimley.

On June 9th the Geologists formed part of the large Field Club excursion to the Hog's Back, going by train as far as Wanborough. Every variety of hammer and chisel seemed to have been provided for the occasion, and the first chalk pit suffered severely. Perhaps it was lucky that few fossils were found in it. After lunch we examined a small pit near Puttenham, but found little beyond pyrites nodules, the chalk being hard and much crushed. Moving on towards Guildford, we examined a large disused pit on the south of the escarpment. More fossils were found here, Tallents getting a good Lima spinosa, while Corse Scott, Twemlow, Leith Ross and Pierson found several Echinus spines, Terebratula, Rhynconella and Micraster. The weathering of the chalk, the growth of the soil and the effective action of roots of trees were well shown in this section. After visiting two small and rather unproductive pits, we joined the rest of the party at tea at Puttenham, and afterwards found the time left before our train too short for the sections we meant to visit, so had therefore to make for the station.

On June 28th, a whole holiday, a small geological party made arrangements to visit the Farringdon sponge beds, but the lateness of our South Eastern train prevented our getting further than Reading. The original plan was, therefore, abandoned, and cycling to Pangbourne, we rowed up the river and examined some chalk pits on the left bank. Beyond some Echinus spines, found by Hill mi., very little was to be seen in the way of fossils.

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However, a bank of chert and quartzite water worn pebbles about 70 ft. above the present river level was noticed and traced for some distance. Riding home through Reading and Sonning we examined a pit above the latter village, finding two large "pipes" and a large number of nearly spherical flints, most of which contained sponges.

On July 14th, there was a general Field Club excursion to Hook Common, the majority in brakes; the geologists, for the sake of mobility, on cycles,—an arrangement which proved most satisfactory. After examining the beds cut by the widening of the L. and S.W.R. near Hook, we descended to the line and found fairly numerous, but fragmentary remains of marine shells brought up from a pit 25 ft. below the level of the line. Leaving the railway we rode to the large chalk pit near Odiham, where little beyond a fragmentary Echinus and some sharks' teeth (broken) were found. After tea, at Odiham, we all enjoyed a very pleasant ride back in the cool of the evening.

In addition to the above, the following excursions were made by smaller parties, viz., to Bracknell, Reading, Winchfield, Dorking, Binfield, Guildford and Gomshall.

In the above excursions there has been a tendency to consider the collection of specimens all important, while general observations as to the order, structure, and texture of strata have thereby suffered. The following points for observation are therefore put forward as suggestions. They have the double advantage of being found in the immediate neighbourhood and also of being of permanent value.

1. Blocks of sandstone, large and small, are from time to time found in the gravels. Records of the finding are of value. Did they occur at top, middle or bottom of gravel? Size? Hard or soft? Photographs of any such blocks, large or small, before they have been moved would be of great value.

2. Pebbles of white quartz are common in the gravel up to ¼-inch in diameter. Large pebbles and blocks of quartz are rare, and their discovery worth noting.

3. Fossils occur in the Bagshot Beds, usually in a green coloured sand. Sections, Wells, etc., which show a green sand, are always worthy of careful examination.

4. Notes should be made of the differences in contour, fertility, etc., due to geological structure.

5. Methodical observation of the action of a stream however small.

G. E. BLUNDELL.

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PHOTOGRAPHIC SECTION.

BALANCE SHEET.

RECEIPTS.

1900.	£	s.	d.
Balance, December 31st, 1899	18	11	7
Lent Term—Terminal Subscriptions ...		15	0
Entrance Fees	1	0	0
Midsummer Term—Terminal Subscriptions	1	0	0
Entrance Fees	2	0	0
Michaelmas Term—Terminal Subscriptions		9	0
Entrance Fees		5	0
	£19	0	7

EXPENDITURE.

1900.	£	s.	d.
Lent Term:			
Knight, Hypo.		2	6
Adams, Copper Lamp	1	1	0
Repairs to Room, Spear & King ...	1	6	9
Repairs to Taps, &c., Martin ...		14	0
Midsummer Term:			
Knight, Hypo.		14	10
Repairs, Spear and King		11	0
King & Co., making Slides		8	2
Michaelmas Term:			
Heelas, Towels, &c.		5	5
Knight, Hypo.		8	0
Cleaning and Attendance for Year ...	1	10	0
Balance, December 31st, 1900	11	18	11
	£19	0	7

F. A. NICOLSON. *Secretary.*
P. H. KEMPTHORNE, *Director.*

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THIRTY-SECOND ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1901.

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"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."

Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1902.

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WELLINGTON COLLEGE:
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Contents.

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RULES.

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1. That this Society be called the "Wellington College Natural Science Society."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the Number of Associates to Seventy.

3. That only members of the Upper School, with Upper Middle I and the Upper and Middle Seconds, be eligible as Associates, or be admitted to lectures; but that the Committee have power to elect or admit members of the Middle School who have shewn special interest in Science or Art. And that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

5. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

6. That the Secretary, and Treasurer, be elected annually at the last Meeting of the Midsummer Term.

7. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

8. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

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9. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

10.—That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

11. That in the absence of any officer, the Committee appoint a Deputy.

12. That Honorary Members and Corresponding Members have all the privileges of Members.

13. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

14. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions persons who have lectured before the Society, and other Benefactors.

15. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names, with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President; and that Members be elected by the Committee.

16. That Members pay a subscription of 1s. 6d., and Associates of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

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17. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last Meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

18. That Members may speak and vote at all Meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

19. That Associates may speak at all Meetings; and may read Papers with the leave of the President.

20. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

21.—That Prefects may attend all Public Meetings without tickets.

22. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

23. That Meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

24. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

25. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

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26. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

27. That a certain number of Officers be told off to collect the exhibitions.

28. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

29. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

30. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

31. That additional members, elected by the provisions of Rule 30, need not be in the Upper School.

32. That there be a Photographic Section, a Field Club Section and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

PRESIDENT—S. A. SAUNDER, Esq.

VICE-PRESIDENTS: REV. P. H. KEMPTHORNE, J. L. BEVIR, Esq., H. W. OWEN HAGREEN, Esq., REV H. P. FITZGERALD.

SECRETARY: S. V. P. WESTON, J. H. CROFTON — TREASURER: E. S. G. WICKHAM, J. C. F. ROYLE

DIRECTOR OF THE PHOTOGRAPHIC SECTION—REV. P. H. KEMPTHORNE.

SECRETARY OF THE PHOTOGRAPHIC SECTION—F. A. NICOLSON.

DIRECTOR OF THE FIELD CLUB SECTION—REV. H. P. FITZGERALD.

SECRETARIES—For ORNITHOLOGY AND OOLOGY, C. M. ROGERS.
For ENTOMOLOGY, C. T. BROOKES.
For BOTANY, J. W. BEST.

DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, Esq.

CORRESPONDING MEMBERS.

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PROF. T. RUPERT JONES, F.R.S.
B. E. HAMMOND, Esq.
H. W. EVE, Esq.
VEN. T. H. FREER.
REV. W. MOYLE.
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	£	s.	d.
Balance in hand	112	7	9
Subscriptions:			
Lent Term—Honorary Members ...	8	10	6
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Easter Term—Honorary Members ...		8	0
Members and Associates	6	2	6
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Members and Associates	4	8	0
Bursar, for Oxygen		2	0
Sale of Report	8	16	8
Interest on Deposit	1	10	6
	£141	18	11

EXPENDITURE.

	£	s.	d.
Gas and Limes for Lectures		14	1
Carriage of Parcels...		17	11
Stamps	1	4	4
Hire and Purchase of Slides		18	1
Hook, for reading Thermometers... ...	2	0	0
Negretti and Zambra for Charts		5	5
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Printing Cards, Notices, &c.	2	0	0
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Examined and found correct,

December 16th, 1901. S. A. SAUNDER.

J. C. F. ROYLE, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 9th.

H. W. Monckton, Esq., V.P.G.S. (O.W.) delivered a lecture entitled "A walk along the Swanage cliffs."

Mr. Monckton began by explaining how the difference in the formation of rocks was often due to their being laid down at different depths beneath the surface of the sea. The way in which littoral deposits are formed may at any time be observed by taking a walk along a sea-beach. For examining the formation of deeper deposits a dredge is necessary. This was illustrated by a few views of the Yorkshire shore and the lecturer then turned his attention to the coast of Dorsetshire. He started by describing the cliffs at Kimmeridge and gradually worked his way through the various strata past Swanage, ending his imaginary walk near the Dorsetshire border. At Kimmeridge the cliffs are formed of Kimmeridge clay, a dark coloured shale. This must have been formed at a considerable depth, for it is composed of fine-grained mud. It is full of Ammonites and other shells which appear to have sunk and been buried before the decay of the animal and are now mostly found in a crushed condition. The Kimmeridge clay stretches across England to Yorkshire and also extends into Normandy. Above the Kimmeridge clay is Portland sand, and above that again Portland limestone. The latter can be seen at St. Alban's head, where it is quarried for building purposes. The ammonities and bi-valves which it contains are larger and less crushed than those in the Kimmeridge clay. The lower portion of the Portland stone is not used for building, as it contains seams of chert. Above the Portland stone is rock formed of myriads of oyster shells. As oysters like a current, this rock was probably deposited in fairly shallow water. Passing on we come to the lower Purbeck stratum which appears to have been formed in a lake, mammal remains are found just above it. The elevation of the Purbeck continent separated the Aquilonian or Northern sea from the Tithonic or Southern sea. The middle Purbeck Beds contain the lower Purbeck building stone and the cinder beds, a huge mass of smaller oysters. Above this are the upper building stone, the Corbula beds, the broken-shell, limestone and the twisted strata of the Purbeck Marble.

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The upper building stone contains scutes and teeth of crocodiles, and plates of turtles; the Corbula beds contain the halves of small bi-valve shells with the convex side usually uppermost. At this point the lecturer showed an interesting slide giving a good idea of a double fault. Above the Purbeck beds, the Wealden, a soft fresh-water formation with a few hard beds appears at Swanage. With it the fresh-water beds end. East of Swanage is the Green-sand. This is a sea-formation, and contains bi-vaves with the two valves united. The Chalk appears at Corfe Castle; and above the chalk are the Reading beds and London clay and then sand containing hard lumps of iron sandstone. This is the Bagshot Sands, an estuary and river formation. The lecturer concluded by showing us a lump of thin iron sandstone which had been isolated on the top of a mound by the action of the weather.

Mr. Kempthorne returned thanks to the lecturer. He mentioned that geology was a very interesting study, and might well be taken up as a hobby during the holidays. Mr. Monckton, he said, had shown how interesting it might be.

Saturday, February 23rd.

The Rev. P. H. Kempthorne, gave a lecture on "Greek Statuary."

The Lecture was illustrated by a large number of slides, the majority of which had been made from originals in the British Museum especially for it. The Lecturer stated that his object was, dealing with the subject from the Art point of view, to give some help to the tourist in judging of the merit of a statue and in assigning its proper period.

Great difficulties arise from the fact that we have hardly any originals, and in many cases only copies of copies made in Roman times. The originals in Greece had mostly been burnt in kilns for mortar, if marble, and, if bronze, melted down for the value of the metal. The copies were frequently not exact, and were altered to suit the taste of the manufacturer, or the customer. Many are base mechanical productions.

We can have more confidence in the carvings which survive on temples, but these have been sadly weathered and mutilated in the course of over 2000 years.

The extensive discoveries in tombs and on the site of ancient cities have thrown great light on the history of Greek sculpture, and the artistic judgments of the last two generations have to be largely modified.

We must not judge the artists of the 6th century too hardly. In archaic periods we find artists who have great ideas, but

find difficulty in managing an obstinate material such as marble or bronze, are hampered by imperfect processes or bad tools, or finally are bound down to previous conventional representations. The best period begins when the technical difficulties are mastered and skill accompanies high ideas. Decline sets in when technical skill is common, but originality has disappeared, and taste become depraved. Such a period seeks to arouse interest by sensuous productions or scenes of horror. The characteristics of the archaic sculptures of the 6th century were described in detail with illustrations, the development of elaboration and expression among the Ionian race, and of athletic representations among the Dorians being noticed, especially in the Aeginetin sculptures.

The last half of the lecture does not admit of an abstract. The lecturer illustrated the differences between the 5th century, the 4th century, the Hellenistic, and the Græco-Roman period, by taking one by one the differences in each period of dealing with the male figure, the female figure, especially the Amazon type, with portraits, with figures in rapid motion, with monuments, and with groups, giving preference on the whole, in common with the prevailing voice of antiquity, and against the critics of the present day, to the early half of the 4th century. The Terra-Cotta statuettes were then touched upon, and in conclusion the Lecturer pointed out that one great reason why the Greek ideal of human beauty had never been superseded was because the Greeks never admitted anything as beautiful which was inconsistent with the healthy development of the body.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, March 23rd.

The Rev. T. Lemmey gave a lecture on "Worms."

He first gave an account of the earth-worm. In spite of the popular dislike these animals are of great use. They are found nearly all over the world and are remarkable as being divided into very few genera. In England there are only a few different kinds, and these are very generally distributed through the whole country. The only kind of soil which is not frequented by worms is very dry soil. Consequently they are not found where there is heather or beneath large trees in summer; but they are very numerous under trees in wet weather.

The lecturer then proceeded to consider their structure, which he explained with the help of diagrams. They are cold-blooded, which is perhaps one of the reasons why they are so disliked. Their bodies consist of a number of rings joined by muscular tissue. These rings sometimes number as many as

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one hundred and twenty. Their structure makes their bodies extremely flexible. Running along their bodies are eight rows of bristles which can only be observed on close inspection. It is these bristles that make it possible for the worm to move.

The habits of the worm were next discussed. It comes to the surface at night but generally leaves its last few rings inside its burrow so that it can retreat quickly in case of danger. With these few rings and the help of the bristles on them it secures a very firm hold of the entrance to its burrow and can hardly be pulled out; indeed it can more easily be pulled in pieces than forced to let go its hold. Worms are very retiring and probably only come to the surface when ill. There is a popular belief that worms are drowned by heavy rains, but probably their death is only accelerated, and those that we see lying dead on the surface after rain were probably in a bad state of health and so came to the surface and died. A further popular belief is that worms eat dead bodies, but their food is really vegetable, though it has been proved that they will not refuse raw meat. They have a great preference for onions, and also like parsnips, celery, primroses and the leaves of the wild cherry. They are very timid and dislike light and heat; in fact heat is fatal to them, for it dries the slimy coating which enables them to make their way through the soil. It has been calculated that in one acre of good garden ground there are about 57,000 worms beneath the surface; but in poorer soils there are not so many. On an average there are probably about 25,000 worms to every acre of land in England. These numbers are maintained in spite of the fact that birds feed very largely on worms. Acetic acid is fatal to them, and they can detect it by its smell. Some was accidentally spilt in a field, and the next day hundreds of worms were found lying dead on the surface. The work that worms do is extraordinary. It has been reckoned that on one acre the castings during a year would weigh 7½ tons. On poorer soils, where the castings are larger, as much as 20 tons is sometimes deposited in one year, and this in spite of the fact that worms do not work in the summer, but burrow down into the ground to a depth of eight or ten feet. For the greater part of the year however the worms live in the superficial mould. It has been calculated that in a million years about 320 millions of millions of tons of soil have passed through the bodies of worms in England alone. The worms swallow the earth as they burrow and eject that from which they can get no nutriment. This is the reason why the casts are larger on poor soil. Worms have two lips and a pharynx or muscular entrance to the throat which can be pushed forward or drawn back to assist the lips in eating. The food passes from the throat to the gullet, on each side of which are three glands in which calcium carbonate is

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secreted. From the gullet it passes to the gizard, where it is ground between stones and thorns which the worm has previously swallowed. It finally passes out through the intestines, where any nutriment is absorbed into the blood-vessels. Though worms live in darkness and have no eyes, they are yet sensible to light, which when concentrated on the end of the body near the head appears to irritate them. They can detect certain foods and injurious matter by smell; but they cannot hear. However some worms in a flower pot were once placed upon the sounding board of a piano and they could detect the vibrations when a note was struck. Bishop Stanley tells a story of a tame pewit which used to walk about on his lawn and beat the ground with one foot; at the beating the worms would come out of their burrows. Worms have blood-vessels which can be contracted and expanded to keep the blood in motion, but they have no regular circulation. They have no lungs or definite breathing apparatus, but breathe through the pores of their bodies.

The eggs of the worm are laid in autumn and are hatched naturally. The shells are made of carbonate of lime and are pear-shaped. At one end is a valve which opens when the worm is ready to come out.

The burrow of a worm is made by pushing aside the poorer soils; the rich soil has to be passed through the worm's body and is taken up to the surface as a casting. Stones and leaves are dragged to the mouths of the burrows to conceal them from enemies and to keep out tho rain. The worms attach themselves to the leaves with their lips and make a vacuum by drawing back the pharynx. They have sense enough to take hold of the thinnest end of the leaves, so that they can the more easily drag them into their holes. The burrows are sometimes eight feet long and end in a broader chamber containing stones and large seeds and often lined with leaves. If the worms were to lie on the bare ground they could not breathe properly. The size of the earth worm varies to some extent, but there are no very large kinds in England. In India, however, worms have been found two feet long and half an inch in diameter.

One might suppose that the depth of the superficial mould formed by the worms would gradually reach the depth of the deepest burrow; but this is not the case. On even a slight slope the rains wash away the castings, and in dry weather the castings crack and are blown away as dust, so that the soil is denuded on the top.

At this point the lecturer left the earth worms and turned to parasites. The first of which he spoke was a worm which infests the muscles particularly of rats, but sometimes of man. It is not uncommon in Germany and is supposed to be

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introduced into the system by eating raw pork infected with the disease. A pig might easily contract it by eating a dead rat. The disease is fatal.

The Taenia or tape-worms were next considered. They are of great length and of many joints, but the true animal is in the head, which throws off segments. These infest the internal organs of animals and men, particularly in India. They have hooklets and suckers on their heads which enable them to grasp any object they please. Thread worms with which children are infested, and flute worms which attack sheep, and set up a disease known as rot, were also mentioned.

Mr. Saunder proposed a vote of thanks to the lecturer for the way in which he had made a somewhat unpromising subject extremely interesting.

Saturday, May 11th.

THE REV. C. R. L. McDOWALL gave a lecture on "Rome."

The lecturer began by announcing his intention of dipping into Roman history at various periods, and discussing such places or persons as could be illustrated by the slides at his disposal. He started with the Campagna, once covered with the gay villas of the aristocracy of Rome, deserted in the fifth and sixth centuries owing to the ruin of patrician families and the inroads of invaders; deserted still, but strongly characterised by its ruins of road, and tomb, and aqueduct.

Views of the Palatine fitly formed an introduction to Rome itself; for here the first settlement was made by shepherds from the Alban Hills; called Rome from the old word 'rumon,' a stream; and meaning the river-city; Romulus thus meaning the man of the river-city. This hill, where the history of Rome began, became the Belgravia of the Republic, and later the site of the Emperors' palaces. Characteristic of republican Rome, too, were the Vestals, with their home at the foot of the Palatine; guardians of the city-hearth, a wealthy and privileged order; enjoying too, sole right to drive in the streets of Rome, and able to reprieve a criminal by the mere fact of meeting him on the way to execution.

To illustrate the earlier period of the Roman Empire the lecturer showed views of three places of public resort, the fora, the Colosseum, and the baths. The history of the Forum Romanum belongs more properly to the time of the Republic, but was here treated in connection with the later additions to it. Originally it was a piece of marshy ground: here the chasm yawned into which leapt M. Curtius, "a right hardy knight and martial young gentleman," to satisfy the oracle which demanded

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the sacrifice of Rome's most precious possession. It was not excavated till 1870; now, like the historian of the Empire, we can tread its ruins "with lofty step," and, more accurately than he, observe "each memorable spot where Romulus stood, or Tully spoke, or Caesar fell." The first emperors built five more fora to continue this, the last being that of Trajan, who removed a whole ridge to make room for what is said to have been the masterpiece of Roman architecture. Then came the Colosseum, where hnman bloodshed continued till the 6th century; and the baths of Caracalla, for the better comprehension of which there was given an imaginative reconstruction of them in the quadrangles of the College.

Christianity in Rome was represented by pictures of the Catacombs, the Christian cemeteries; cemeteries too of some against their will; for once at least a whole congregation was there blocked up by the Roman persecutors, till the skeletons were discovered a century later. Hadrian's Mausoleum, or the Castle of S. Angelo, so called from the appearance of the Archangel there to Gregory the Great on the occasion of the plague and penitential procession, suggested the mention of the Papacy, which was raised by this Gregory after the collapse of the Western Empire to be the chief power in Italy. Then the lecturer passed from the 6th to the 16th century. In In this period the Holy Roman Empire came into existence, beginning with the alliance of the Pope, and the Frankish king, Charlemagne, in 800, A.D. To represent the 16th century Pope Julius II was selected, not for any merits of his own, but for his connection with three greater names, Michael Angelo, Raphael and Bramante. This last was the architect of the new S. Peter's. The old church had been built by Constantine over S. Peter's grave. This was destroyed to make way for the huge building which Julius determined should mark a new era.

In the present century were shown pictures of Garibaldi, the romantic crusader, to whom the recovery of Rome was always a primary object in the struggle for the unification of Italy; and of Pope Leo XIII, who, like his predecessor, because he will not give up his claims to temporal sovereignty, still "plays the reproachful part" of the Prisoner of the Vatican.

At the conclusion Mr. Hagreen proposed a vote of thanks to the lecturer for his exceedingly interesting discourse.

Saturday, May 25th.

O. H. Latter, Esq. gave a lecture on the "Natural History of the Marram Hills."

The lecturer said that he was going to give an account of the

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observations which he had made himself while spending a holiday at Waxham, near Cromer. The first slide was a picture of the Norfolk broads, which are protected from the sea by a continuous line of sand-hills, called the Marram Hills; these sand heaps are much exposed to the winds; a photograph was then shewn in which the side of a hill had been deeply cut by the force of the wind. Another effect of the wind was to blow the sand dust to the landward side where a new formation occurred. Originally the Marram Hills were several miles seaward of their present position but by the easterly winds they had gradually been driven inland: from the west they were protected by trees. At a place called Eccles, there was to be seen, now on the seaward side of the Hills, the ruin of a church which was formerly on the landward side. Passing on to the vegetation which exists in these parts, the lecturer showed some slides illustrating a great peculiarity in the grass: the sheep refuse to eat it and feed only on oaks and sycamores, whereas the hawthorn is untouched. Then came a picture of the Marram grass; the plants grow to the height of about three feet and have a resemblance to other tall grasses except in so far as they do not put forth horizontal leaves to cut the force of the wind: the leaves are of two kinds, firstly, tubular, and secondly, narrow, flat and stiff, slightly twisted so as to break the force of the wind; like other vegetables this grass needs moisture and sunshine: how it gets the former was shown by a picture of the grass, root and all, laid upon the ground: the total length underground was more than four feet, that above the ground about three. It was then shown how by means of evaporation holes the plant secures food from the soil and remains turgid. The next two photographs were of sections of the grass showing how it received the necessary moisture and also the effect of excessive drought on it. Then was shown the sedge grass which grows on hard stalks with little saws all the way up: here the cocoons of the burnet moth are frequently found. The thistle flourishes in these parts and is very well protected from animals by prickles projecting every way. Another peculiar plant is the sea-holly, of a beautiful green grey colour and of strong build to resist the winds. Lastly in the way of vegetation, was a picture of the Marine Convolvulus, which is remarkable for its round fleshy leaves which hold water for a very long time. Turning to the insects the lecturer pointed out some lizards which are so exactly the colour of the sand that they can scarcely be seen until they move. Then came the grub of the tiger beetle, whose chief peculiarity consists in two humps on its back by which climbing is made easier. They have a habit of sitting at the mouth of their holes, blocking them up so as to make them less visible. Perhaps the most interesting insect was the

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Sand Wasp, which is not unlike the ordinary wasp, except in so far as it can scarcely fly: we heard an interesting account of hours which the lectnrer devoted to watching one of these creatures catching spiders. The last slide showed a saw-fly larva of about an inch and a half in length, orange yellow with numerous blue spots, which showers with acid liquid anybody who takes it up.

At the conclusion of the lecture Mr. Kempthorne, after returning thanks to Mr. Latter, said he would like to make two further remarks; in the first place, we had been given a very valuable insight into the proper method of observation and he hoped fellows would profit by it: in the second place, he appealed to photographers to photograph natural curiosities, even if they did not understand them themselves, so that they might show them to people who did.

Saturday, June 29th.

A Conversazione was held in the Drawing School.

One of the principal features of the evening was a demonstration of "three colour printing," most kindly arranged by Mr. E. Poynder, of Broad Street, Reading, who set up a complete printing machine in the room. The thanks of the Society are especially due to Mr. T. Poynder, who superintended the work and explained the process. In this three photographs of the object to be represented are taken through three colour filters which allow the passage of red, blue and yellow light respectively. From each of these photographs a "half tone" printing block is made, and then the printing from these blocks in the proper colours, one over the other, produces the full range of colour of the "three colour" prints with which we are now becoming familiar.

At an adjoining table an Ives' "Kromskop" was exhibited, showing the somewhat analogous method of colour photography. In this method three photographs are taken through carefully selected colour screens allowing the passage of red, green and blue light respectively. By an ingenious arrangement of lenses and mirrors the images these three photographs, illuminated through glasses of the appropriate colours, are superposea and viewed simultaneously through an apparatus somewhat resembling the ordinary stereoscope in appearance, when a most realistic effect is produced, the original colours being shown with great exactness.

On the same table were a couple of polariscopes with a number of interesting crystals, selenite butterflies, chameleons, spec-

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imens of unannealed glass and other objects kindly lent by Mr. Rogers.

At the next were a number of microscopes lent by various members of the staff, under which were shown a variety of objects, entomological, botanical and mineral. A frog, which was displaying the circulation in its feet, received much undeserved sympathy, as it was supposed by some of the less informed naturalists to have been "chloroformed to prevent its heart beating."

At one of the central tables Mr. FitzGerald showed a collection of natural products from the West Indies. Amongst these were a Globe Fish, a Cow fish and various shell fish, a Crucifix fish, Humming bird's nest, Trap door spider and nest, Edible frogs, Gulf weed, pieces of the Lace bark tree and a whip made from the same, cocoa pods, coffee, nutmegs and various other objects of a like nature.

The Egyptian antiquities belonging to the Museum had been never adequately exhibited and for long totally unseen, so that they afforded quite a surprise when carefully set out. As the Master has kindly sanctioned the making of some new cases it is hoped that before long these may be fully labelled and permanently exhibited.

A selection of book illustrations and title pages was arranged by Mr. Perkins. The former were selected to show the wide range of methods employed from line engraving to modern photographic processes. A series of pictures of birds, from the hand coloured engravings of Gould to Bewick's masterly woodcuts, afforded some exceedingly interesting comparisons. Mr. Perkins also showed a particularly fine collection of photographs of Rome which he had taken himself during a visit made in the previous Easter holidays, and Mr. Awdry obtained the loan of some prints from original negatives made by H. Fox Talbot, the inventor of photography.

Much interest was shown in a model man-of-war made by Lascelles, one of the finest pieces of work which has ever been produced at the carpenter's shop. The screw was worked by a small electro-motor concealed in the hold.

In one corner a number of physical experiments were exhibited including a vortex ring box, a penny in a basin of water connected with an induction coil, a double cone which apparently rolled up hill, and a number of Geisler tubes.

Twice during the evening Mr. Hepworth gave, in an adjoining room, an exhibition of "X ray" photography, which included the taking and developing before the audience of a radiograph of a hand, and the exhibition of a varied and interesting collection of lantern slides.

The evening concluded with an eruption of a model geyser,

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but although the roar of the explosion was distinctly heard very little was seen of the jet of boiling water and steam, as it was necessary that the apparatus should be set up outside, and an approaching thunder storm caused the night to become suddenly of almost total darkness.

Saturday, July 8th.

H. W. Grubb, Esq. (O.W.) of the Border Regt., delivered a lecture on "Musketry."

The lecturer began by announcing his intention of dealing first with the history of the Magazine rifle and then with the ammunition used. The Handgonne was the first firearm used with gun-powder; it was introduced in 1466. This weapon was merely a tube fitted into a stock two and three quarter inches long; it was fired by means of a taper. In 1485 a trigger was added and a piece of metal to which the taper could be fastened: at the same time a stock more like the modern one was introduced: this was called the match lock. The first piece of mechanicism was used in 1517 in the Wheel Lock, so-called because inside was a wheel, which on being wound up, and then released by the trigger, kindled a spark and fired the charge. In 1635 the Flint Lock was first used; a rifle called the 'Brown Bess' was then introduced, and used in the British Army for two hundred years. As an experiment in 1800, the 95th were armed with 'Baker's rifle'; it was not a success however, and the 'Brunswick' was tried. In 1842 fulminating powder was invented and what is called the Percussion Cap Action came into use; but even then 150 yards was the outside range that these rifles would carry. All the rifles mentioned so far were muzzle-loaders, and it was not till 1864 that the possibility of breach-loaders was thought of. At this time cartridges containing their own means of ignition were also first used, because they were necessary for the breach-loaders. The disadvantages of the muzzle-loader were many; a man had to stand up to load: it was very slow work; it was impossible to keep the barrel clean as one could not see down it: only one charge could be put in the rifle at time: and it was difficult to ram a bullet down the muzzle. Shortly before 1864 the 'Enfield' was in use. Snider's suggestion for a breach-loader was applied to this rifle; about this time steel barrels came to be universally used. The next rifle was the Martini-Henry which is still preferred by some volunteers to the up-to-date rifle. In 1883 a committee was formed to consider whether England should have magazine rifles, that is, rifles that can hold spare cartridges ready to be fired. The result was that in 1887 the 'Lee-Metford' was introduced, so-called because Lee invented

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the bolt action and Metford the barrel. Magazines in rifles are of two sorts: first, a tube behind the barrel; secondly, a box under the breach; the former has two disadvantages: it makes the balance of the rifle vary, and the cartridges are liable to get battered by each other in the tube.

The next point of interest in the Lee-Metford rifle was the "cut off," by opening which the marksman can fire magazine-volleys: this is used only in emergencies when there is no time for single-loading. The lecturer then went on to distinguish between magazine rifles and machine guns, both of which fire bullets, and quickfiring guns, which are loaded with shells. The rifle now used most generally is the Lee-Enfield, as the Metford barrel was found to be unable to stand the strain of firing 600 rounds a minute. The Enfield barrel is stronger and at the same time easier to make because the grooves are square instead of circular.

Passing on to the ammunition used, the lecturer passed round for inspection the various parts of a cartridge: first the metal of which the case is made, both flat and in a lump before being hammered out: then some leaden bullets which are put into a nickel envelope to make them harder and prevent fusing: then a bottle containing sixty strands of cordite. Inside the barrel the groove completes a revolution in a distance of about ten inches; hence, seeing that the barrel is forty inches long, a bullet revolves four times before leaving the rifle; in a second it revolves 2,400 times. Now though the bore of the rifle is ·303 inches the diameter of the bullet is ·311, so that the bullet can only pass down the barrel by following the grooves. The lecturer then briefly touched on the advantages of the elongated projectile: being longer than the round bullet in proportion to the surface exposed to the air it carries further and has greater power of penetration. Lastly we were told why it is necessary to have "sights" on a rifle. In firing there are three forces to be reckoned with: that of the powder, gravity and the resistance of the air. Gravity draws a bullet down to the ground with ever-increasing velocity, and so one must aim as much above the object as the bullet will drop during the time of flight.

Mr. Awdry, in proposing a vote of thanks to the lecturer for his interesting lecture, recalled the days when the Rifle Corps were armed with 'Snider' rifles.

Saturday, July 13th.

C. J. C. Street read his Essay on "The Scenery of Hampshire from a Geological point of view," for which the Pender Prize had been awarded to him.

The scenery of Hampshire depends on the relative hardness

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and solubility of the different geological strata found there. This may be seen by comparing the courses of the rivers running over the chalk downs in the north and west, with those running over the tertiary and lower cretaceous districts in the south and east. The curving outline of the down country is due to the solubility of the chalk, and is quite distinct from the more angular outline of the tertiary area. Many theories have been put forward to account for the absence of water at the bottom of the chalk valleys, and for the formation of the valleys, the best being probably that in places the chalk below the surface has been dissolved away by the hypogene denuding agents, with the result that the ground caved in.

The epigene denuding agents would subsequently round off the resulting slopes, and so form the undulating outline so characteristic of the chalk downs. Intermediate phases in this chain of events have been found. The lack of solubility of the other strata occuring in the county account in the majority of cases for the difference in outline between their outcrops and that of the chalk.

But scenery does not depend only on outline, but also on fertility of outcrop, whereas the chalk is only capable of producing short grass and sparse brushwood, the other strata are amongst the most fertile of those occurring in England, especially the Lower Greensand, which has earned for Kent the name of the Garden of England. The result is that we have tree-clad plains in the south and south west, of which the New Forest is perhaps the best known.

After the Essay had been read Mr. Bevir gave a short account of the history of the Prize and of Henry Denison Pender, by whom it was instituted and in whose memory it had been ultimately founded by his father, Sir John Pender, G.C.M.G., and the President presented Street with the Prize, for which the winner had selected a microscope.

Saturday, Octobev 5th.

S. A. Saunder, Esq., gave a lecture on "Some Lunar Photographs."

After an explanation of how it is that we see only one side of the Moon a copy of the first photograph ever taken of it was thrown upon the screen. This whilst shewing some detail was greatly inferior to those now taken with the 36-inch refractor at Lick and the great Equatorial Coudé at Paris. A short description was given of these telescopes and then a series of views of the whole Moon was shewn illustrating the changes

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which occur during a lunation. After this a number of enlarged views of smaller portions of the surface were exhibited and attention was called to some of the characteristic features on which MM. Loewy and Puiseux base their theories as to the manner in which the surface has been brought to its present form. They divide the Lunar history into five periods merging gradually one into the other. In the first when solidification was commencing, currents in the viscous mass would cause alignments of floating scoriæ, whilst in other parts channels would be kept open. These would give rise to lines of greater and less thickness in the crust ultimately formed and would be the first cause of the rectilinear ridges, valleys and crater rows which we now see. Cracks in the crust, whose edges might either be brought together by lateral pressure, or drawn further apart, would have similar effects. In the second period quantities of lava would be exuded, causing mountain chains like the Apennines. In the third period conical masses were raised, the central parts subsequently sank producing the walled plains and ring mountains. Central cones where they exist indicate former volcanic orifices. In the fourth period the shrinkage of the interior would cause large tracts to sink, the surface in these parts might be flooded with lava obliterating the pre-existing formations and producing the regions called "seas" though we now know them to be waterless. In the fifth period actions similar to those described in the third gave rise to parasitic craters in the mountainous regions, and in the seas to isolated craters like Copernicus or Aristillus. In conclusion the lecturer warned his hearers that whilst there was no doubt that the formations existed as the photographs shewed them there was no real proof that they had been formed in this way and that on this point every one was entitled to form his own opinion.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, October 19th.

H. Awdry, Esq. gave a lecture on "Stories from Greece."

The lecturer began with the Story of Ulysses, as told by Homer. His home, Ithaca, is now desolate, though in his time it was probably woody. On his return from Troy, he came to the Island of the Cyclops Polyphemus, the son of the sea-god Poseidon, who devoured several of his companions, and shut up the rest in his cave. Ulysses and the rest, however, put out the monster's single eye, and escaped him by a trick. He was foolish enough to give his name to the Cyclops, who then prayed to Poseidon to avenge him. The sea-god stirred up storms

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against the wanderers. They next arrived at the Aeolian Islands, where the fire-god Hephaestus kept his forge. Aeolus gave Ulysses all the winds shut up in a bag as a parting present, except the one needed to take him home. With the help of the wind that was still free, he nearly reached Ithaca, but while he was sleeping, his companions opened the bag, and storms arose and drove them back to the home of Aeolus. Here the lecturer shewed a photograph of a mountain on Ithaca, called Aëtos, 550 feet high. He also shewed a view of Ithaca, taken from Aëtos, showing its narrow waist of land dividing two gulfs.

Resuming the story, he related how Aeolus would not receive them, so that they sailed away until they reached an island, which belonged to a sorceress, called Circe, who turned his companions into pigs; but Ulysses was given a herb which protected him, and he forced her to change his companions back to their former state. She then told him of all the dangers which he was to avoid, the first being the *Sirens*, who attracted men to their island by their songs and then ate them. Ulysses made his companions tie him to the mast, and stop their own ears with wax, and so passed safely, in spite of his entreaties to pull to shore, which his companions of course could not hear. They then would come to *Scylla*, a monster with six heads. Each grabbed a man and devoured him; or if he avoided this, *Charybdis*, a dangerous whirlpool, awaited him. Ulysses lost six companions, but got through safely with the rest. A photograph of Charybdis was shewn; the whirlpool, though insignificant, is somewhat troubled even on the calmest days.

Ulysses next reached the island of the Nymph Calypso, with whom he stayed for seven years, being now destitute of companions, for the rest were punished by death for destroying the cattle of the sun. At last Poseidon went to Ethiopia, and Athena took advantage of this to entreat Zeus to let Ulysses go, and he came to the island of the Phœacians on a raft. They entertained him very kindly and took him home to Ithaca. There he found Penelope and his father Laertes still alive, mourning for him, and his son Telemachus, who was now grown up. To get news of his father, Telemachus had visited the wise old counsellor, Nestor, whose home was Pylos, of which a slide was shewn. He also visited Menelaus, King of Sparta. Several slides were then shewn, including an ancient cup, various views of Sparta and her surroundings, and some pieces of ancient engraved cups and jewellery. Next came a photograph of the Bay of Ithaca, where Athena met Ulysses and helped him to carry his treasure to the cave of the Nymphs, which had two entrances, the mortal one being the ordinary opening, the divine one a sort of narrow chimney. When Ulysses came to Ithaca, he found Penelope surrounded by

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suitors, whom he killed. A view of the "Castle of Ulysses" was then shown.

After that came various slides of Epidaurus, including the Theatre, the Race course, and a restoration of the Temple of Asclepius, and pictures of Asclepius and Hygieia the goddess of health. The circular temple, or Thymele, was then shewn, also a Colonnade. Asclepius was the Greek god of healing, and his principal sanctuary was Epidaurus; and it was pointed out that the real healing agency at his various shrines, though ascribed to the lick of sacred serpents etc., was the interesting open air life the patients lived, in contrast to the stuffy unhealthy arrangements of their city homes; and was in fact an anticipation of the modern open air cure. Some slides of modern Sanatoria were shown to illustrate the similarity of the arrangements to those at Epidaurus and other Greek sanctuaries of Asclepius. Then followed some amusing stories of cures affected by prayers to the God of Healing, and a slide was shewn which depicted a miracle going on. Cretan photographs were then thrown on to the screen, including the palace of Minos, which were followed by views of Delos, and Pylos and Sphacteria, the bay now being called Navarino. Some 80 slides in all were shown.

A vote of thanks was then proposed by Mr. Kempthorne, which met with a hearty response.

Saturday, November 9th.

The Rev. H. Purefoy FitzGerald gave a lecture on "The West Indies."

These islands were found by Columbus, in the year 1490; he thought that he had found a short cut to the East Indies, and called them West Indies. At one time they were much infested by pirates. Barbadoes, the first place to which the lecturer went, is an uninteresting place, the country being absolutely bare. A photograph was then shewn of St. Lucia, a hilly island of great fertility. A photograph of a street in Dominica revealed the fact that the main sewer was an open drain down the middle of the street, while the houses were moveable, the owner having to remove his dwelling bodily if he cannot pay for the site. There was only one town of respectable size there, and even in that the only lodging-house was a wooden shanty. A very fine palm, called the "Traveller's palm," grows there, whose leaves when cut at the base produce water which is quite good to drink. The heat in these parts is so great that in

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Church everyone, including the parson, uses fans. On Easter Monday all the populace dressed up and had a sham fight, Boers v. English, which lasted for three days. Some photographs were shewn of this, among the combatants being "Kruger" and "Cronje." The lecturer then described his journey to see a boiling lake. On the way up the mountains he stopped the night in a small hut, and there he had an experience of fleas and insects of all sorts, which allowed no sleep. After very hard climbing the boiling lake was reached; it is really the crater of an old volcano, which, in the course of eruption in 1884, was half blown away, leaving the crater filled with stones and lava. Sulphur springs are found all round it, and enormous boulders are to be seen. The lake itself is covered with a mist rising from the sulphurous liquid. Some photographs of the springs and the lake were shewn. From here the lecturer went back to Barbadoes; the natives there are very offensive and conceited.

He next went to St. Vincent, which is remarkable for its coral and its magnificent gardens. Grenada was next visited, a great object of interest being the pretty bay, of which a slide was shewn, the gardens also being very fine. After this the lecturer went to Trinidad, a very prosperous place, of which the chief town is Port-of-Spain. Photographs of giant bamboos and cocoanut palms were then shewn, followed by one of the Coolie Village. The next view was of a pool with a cascade, two pictures of which had been taken on one plate, both being distinctly seen. Tobago was the next place visited, this is supposed to have been Robinson Crusoe's island, and is very sparsely populated. Venezuela was the next country described. It is peculiar in the respect that it has about 5,000 generals, and is nearly always in a state of revolution. The capital is Caracas, a Spanish town. The next photograph showed a hill which is climbed by a railway. The frogs and cicadas in this town are remarkable, having been known to drown a band with their croaking at sunset. A picture of a bull-fight was then shewn, the bull having a dart sticking into his side. Kingston, the capital of Jamaica, was then visited. Here civilisation is so advanced that electric trams are to be seen. Various photographs were then shown, including a tree with a giant ants' nest, and a bread fruit tree, and last of all came a view of a scene on the Jamaica shore. The lecturer concluded by recommending the trip to the West Indies to people who desired to recruit their health without spending too much money.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

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Saturday, November 23rd.

A. W. ANDREWS, ESQ., gave a lecture on "Mountains and Mountaineering."

. The lecturer alluded to the increasing interest taken in mountaineering at the present day and said that it afforded a vent for that spirit of adventure which has as a rule no legitimate outlet in England. Some climbed mountains to reach the top, some to see the view and some for exercise, but no true mountaineer, though he might combine all these aims, ever imagined that they were the only reasons which led him to climb. Mountaineering above all sports afforded scope for initiative, responsibility and the conquest of obstacles by a combination of hard work and skill, and to men who were probably engaged in some sedentary occupation was a complete mental and physical holiday.

The lecturer showed a series of slides of the Horunger in the Jotunheim, Norway. Coming up from the fjord with its steep glacier worn sides, sometimes reaching to four thousand feet in height, they ascended a broad valley with wooded sides and reached by a narrow path the high plateau of the Jotunheim with its great snowfields and dome shaped peaks. The Horunger region is in striking contrast to the rest of Jotunheim with its sharp serrated ridges and pointed summits. It is only a small region about eight miles across but it contains great variety.

A number of typical views were shewn illustrating snow, ice and rock climbing. A view of a glacier which had broken away and hurled huge blocks of ice several hundred yards across a lake on to the path down which the lecturer had passed the day before was particularly interesting as illustrating the movement of glaciers. The summer had been especially dry and the ice had shrunk away from the rock below and finally a large piece had fallen away. In some parts of the world, especially the Western Alps of New Zealand, where the glaciers are forced down by the weight of ice to a low elevation, such ice avalanches occur every few minutes in certain parts. The lecturer regretted that he had not been there at the time to take, from a safe distance, a photograph of the falling ice.

Among the views of the Alps that followed a picture of an avalanche was shown which had been taken while falling. For this the photographer had, however, to wait several hours, as the avalanche for a long time declined to fall while it was being watched.

The views of the Alps shown, which were taken along the whole Alpine range from France to Carinthia, illustrated in a

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most interesting way the formation of mountains and the infinite variety of their scenery.

Mr. Davenport proposed a vote of thanks to Mr. Andrews for his very interesting lecture and magnificent slides.

Saturday, December 7th.

R. Doyne, Esq., F.R.C.S., gave a lecture on "Visual versus Oral Memory."

The lecturer commenced by disclaiming any intention of teaching how to remember, he would be only too glad if he could learn himself. What he was going to talk about was the process by which memory was effected. When an image—of the letter A perhaps—was formed by the eye on the retina, a message was carried by the optic nerve to that part of the brain called the centre for visual sensation, this was connected by nerve fibres with the centre for visual memory, where the sensation was compared with others previously received. The action of the eye might be compared to taking a photograph which was developed in the centre for visual sensation, and then compared with previously developed plates stored in the centre for visual memory. Sometimes the connection between the two centres was broken giving rise to what was known as "word-blindness," a state in which words although seen perfectly conveyed no meaning to the mind. This interruption might be entire or partial, and might be either congenital or pathological. If the pathological state was set up in early life it was possible that connection might be remade by another route, in which case the process of learning would have to be recommenced. The centre for visual memory might be compared to a store room with many shelves, one for letters, another for numbers, a third for faces, and so on. The process of oral memory was exactly similar starting from the ear instead of from the eye, and the two centres for visual and oral memory were very closely connected although they were not identical. The interruption between one of the centres for sensation and the corresponding centre for memory might sometimes be found in people who in other respects showed very great intelligence. These whilst being able to learn readily in one way, perhaps remembering what they heard, would find great difficulty in appreciating what they read. The brain was capable of only a certain amount of effort, and if nearly the whole of this was required to get a message from the centre for visual sensation to that for visual memory there would be very

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little power left for comparing it with those previously received. The lecturer instanced this state by the examples of several people with whom he had been brought in contact. To illustrate purely visual memory a series of views was thrown upon the screen by a cinematograph, and a story was repeated by a phonograph to illustrate oral memory. A competition was then arranged between two teams one learning a set of letters and afterwards a set of numbers which were thrown upon the screen for a limited time and then reproduced by the competitors, the other team learning similar sets of letters and figures which were slowly read by the lecturer. The marks obtained by the two teams were nearly equal. Several amusing stories were then told by Mr. Armstrong, whilst other incidents were shown upon the screen by the cinematograph. Unfortunately there was not sufficient time to test the powers of the competitors to reproduce the stories.

A vote of thanks to Mr. Doyne for his most interesting and instructive lecture was proposed by Mr. Kempthorne, who wished also to thank Mr. Armstrong, and the various competitors for their assistance.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Monday, February 4th.

At a P.B.M., D. M. W. Hutchison, J. W. Best, S. E. Chavasse, C. A. Chavasse, C. T. Brookes, H. W. T. Palmer, R. C. Trench, C. L. Cameron, C. A. Lucas, J. R. L. Heyland, C. A. Bradford, A. C. de Clermont, H. C. Mansergh, R. D. Owen Jones, R. C. Duncan, N. B. P. Shore, J. O. Oakes, G. V. Wildman Lushington, B. S. Stone, H. S. M. Fellowes, J. C. Armstrong, V. E. Inglefield, R. H. Anderson Morshead, F. A. Baker, A. A. Cole, H. D. Wallis, P. J. Hackett, were elected Associates.

G. K. Allen, R. F. W. P. Higgens were elected to serve on the Committee for the term.

J. H. Crofton was elected Secretary of the Photographic Section.

At a Committee Meeting, W. F. B. H. Gordon, W. S. E. Money, C. M. Rogers, A. Henderson, J. W. Best, were elected Members.

Monday, May 6th.

At a P.B.M., C. G. Porter, H. R. Moore, T. H. Sneyd, P. L. W. Herbert, G. H. E. Twemlow, C. W. Christie, D. K. McLeod, G. B. Rowan Hamilton, L. de S. Bencke, L. V. Heathcote, S. W. Finnis, C. N. Moore, E. H. P. Hanham, R. C. Faulconer, R. R. Forde, G. V. Wellesley, H. S. Gladwin, T. F. Sandeman, C. H. Hone, R. A. Cooper, R. H. Wetherall, R. J. S. Tyhurst, C. T. Carfrae, G. S. Russell Pavier, E. W. Gower, H. T. Lubbock, J. Mallinson, R. Dunn, F. H. Huleatt, J. L. Haig, W. H. L. Bencke, R. Munday, J. M. Lambert, O. P. Dakeyne, H. J. de B. Barnett, C. M. Forster, C. R. Watson, E. G. B. Middleton, G. C. Goulding, J. A. S. Hoyes, T. O. Gibb, J. R. Harrison, R. M. Derry, C. E. H. Davies, F. T. V. Dunne, K. P. Wallis, W. E. Sparling, A. F. Prendergast, were elected Associates.

G. K. Allen and R. F. W. P. Higgens were elected to serve on the Committee for the term.

E. S. G. Wickham and G. K. Allen were elected Judges for the Pender Prize.

At a Committee Meeting, C. J. C. Street, D. M. W. Hutchison were elected Members.

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Saturday, May 11th.

At a P.B.M., H. K. Griffith, H. E. W. Berkeley Hill, C. A. Watson Taylor, H. Grimké Drayton, A. S. J. Spencer, G. G. Petherick were elected Associates.

Tuesday, October 1st.

At a P.B.M., votes of thanks were passed to S. V. P. Weston and E. S. G. Wickham, the late Secretary and Treasurer, who had left.

J. H. Crofton was elected Secretary.

J. C. F. Royle was elected Treasurer.

R. F. W. P. Higgens and W. S. E. Money were elected to serve on the Committee for the Term.

L. G. d'A. Huntington, Esq., F. H. B. Champain, Esq., Rev. S. E. Longland, A. S. Tomlinson, Esq., were elected Honorary Members.

The following were elected Associates: D. L. Ingpen, J. C. G. Hunter, H. K. Shaw, H. Anton, E. W. P. Mills, J. T. C. Wilcox, A. E. Watkin, R. C. Trench, A. D. de R. Martin, W. Ameer Ali, H. F. F. Marsh, R. H. Muir, V. T. R. Ford, J. F. C. Trench, H. C. Mansergh, E. N. B. Hobbs. L. F. H. Athill, A. B. Floyd, L. Gartside, E. F. A. Hay, R. A. Scott, L. Townsend, U. E. C. Joseph, A. Y. Graham Thomson, R. M. Johnson, J. T. Grant, A. H. Lister, M. B. W. Smith Rewse, J. Kennedy, J. W. Pain, M. F. Grove White, A. S. G. Kennard, C. H. Rowe.

At a Committee Meeting, T. C. Newton, A. V. Stanfield, A. J. Dainty, C. E. Pierson, W. Leith Ross, S. E. Chavasse, C. T. Brookes, were elected Members.

Saturday, October 19th.

At a P.B.M., W. D. G. Nash, Esq., was elected an Honorary Member.

W. R. Bertram, W. A. P. Foster, H. Brougham, G. O. Heron, were elected Associates.

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PRIZES.

The Pender Prize.

In 1879, an old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus chosen by the winner, subject to the approval of the President.

The winner may, if he chooses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President and obtain his sanction before sending in the essay.

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6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1901 was awarded to C. J. C. Street for an Essay on "The Scenery of Hampshire from a Geological point of view." An abstract of the Essay is given on page 23.

Lepidoptera and Insect Prizes.

The President offered a prize, value £1, for the best collection of either Lepidoptera or Coleoptera, not being a combined collection of both, made by a Member or Associate during the year ending in July. The specimens must have been found in the neighbourhood, they must have been caught or bred and also set by the competitor himself; they were to be as far as possible named by him. The Society offered a second prize, value 10s.

The first prize for 1901 was awarded to S. E. Chavasse. The second prize was divided between C. T. Brookes and C. M. Rogers.

Mr. Bevir also offered a prize open to the whole Middle School for the best collection of all insects, except dragon-flies, made by any one collector during the year ending in July, 1901.

The prize was not awarded.

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Note Book Prizes.

One or more prizes were offered to members of the Field Club Section for the best Note Books containing records of original observations made during the Summer Term.

The first prize was awarded to W. Leith Ross, whilst C. T. Brookes and C. M. Rogers were equal for the second prize.

Photographic Prizes.

Mr. Kempthorne offers a yearly prize, value £1, to Members of the Photographic Section. The conditions may vary from year to year.

The prize for 1901 was for the best photograph considered as a picture. It was awarded to B. F. Huggins. Honourable Mention, G. H. Errington, H. R. Moore, C. H. Rowe.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·97	38·9	34·9	63·4	36·4	36·1	95	10	·03	N.E.
2	30·17	42·7	29·9	79·9	33·4	33·3	98	5		S.E.
3	·31	41·9	27·4	79·6	33·9	33·8	99	10	·01	S.E.
4	·38	39·1	29·0	65·7	31·7	31·6	98	10		S.W.
5	·38	38·3	23·7	63·9	25·2	25·2	100	0		W.
6	·13	34·9	24·5	50·4	29·7	29·5	96	9	·03	N.E.
7	30·04	42·2	24·7	50·7	27·9	27·8	98	10	·15	N.E.
8	29·81	31·7	23·5	51·9	28·1	28·0	98	10	·24	N.E.
9	·73	43·1	10·8	55·9	29·2	29·1	98	10		N.E.
10	29·86	50·5	28·6	89·1	42·2	41·9	97	10		N.E.
11	30·01	45·1	37·0	70·0	41·7	41·4	98	10	trace	S.
12	·27	44·1	29·8	66·1	34·1	34·0	99	10		S.
13	·39	43·1	34·3	65·1	40·4	40·1	97	10		S.
14	·40	43·9	27·6	74·8	35·1	34·6	95	8		S.E.
15	30·17	40·9	27·4	75·4	32·7	31·6	86	4	trace	N.E.
16	29·77	47·4	28·9	55·1	39·7	39·1	95	10	·02	S.
17	30·04	49·9	39·0	80·9	46·4	46·1	98	10	·12	S.
18	30·06	47·4	39·2	79·1	42·1	42·1	100	10	·16	S.E.
19	29·58	47·9	40·4	57·1	41·2	40·9	97	10	·06	S.W.
20	29·98	55·9	36·5	88·9	39·5	38·1	87	8		S.W.
21	30·26	52·4	39·2	80·9	48·9	47·6	90	10		S.W.
22	·26	49·1	46·1	58·9	47·4	45·7	88	10		W.
23	.55	45·9	28·6	59·4	34·2	33·8	89	10	·02	W.
24	30·16	46·5	34·3	61·4	41·7	41·7	100	10	.09	S.W.
25	29·72	47·1	35·1	93·1	40·5	37·7	78	0	·03	S.W.
26	·93	50·7	35·8	90·7	41·7	41·7	100	4	.05	N.E.
27	·45	57·0	40·9	71·1	50·9	48·4	83	5	.20	N.W.
28	·53	41·1	35·5	61·7	53·7	45·2	53	10	.11	S.W.
29	·46	40·9	28·2	86·1	35·1	31·3	65	10		W.
30	·37	40·1	31·3	82·9	34·7	33·8	90	8	trace	S.W.
31	29·41	36·2	27·6	76·3	33·4	31·6	79	10		N.W.
Mean	29·99	44·4	31·6	70·5	37·9	36·9	93	8·4	Total 1·32	
Mean for 19 years	29·96	43·1	32·2	64·4	37·5	36·5	90	8·3	2·02	

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FEBRUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	%	0—10	In.	
1	29·73	40·9	24·9	82·7	34·1	32·0	79	2		N.W.
2	·42	40·9	28·6	75·8	36·3	35·6	94	10	·06	S.W.
3	·54	38·4	32·9	62·2	34·9	33·4	85	10		N.E.
4	·49	37·9	23·0	76·0	30·2	29·2	84	10	·62	S.W.
5	·33	39·2	29·3	62·4	31·7	31·4	95	10		N.
6	29·89	36·4	32·1	85·1	34·4	33·8	93	10		N.
7	30·23	37·9	25·9	93·4	30·4	29·2	81	10		N.W.
8	·29	38·2	26·9	83·1	35·1	35·0	99	10		N.W.
9	·34	40·3	33·8	78·4	37·1	36·3	93	10		N.W.
10	·44	39·9	32·7	65·9	36·7	35·8	92	10	·05	N.
11	·28	36·3	34·0	69·3	34·4	34·0	95	10		N.E.
12	·22	35·7	20·3	82·4	28·7	27·0	71	2		N.E.
13	·20	35·1	27·4	63·1	32·1	32·0	98	10		N.
14	·33	33·5	12·8	92·7	24·7	24·1	84	3		E.
15	·48	37·5	24·0	96·1	33·1	32·6	95	5		N.E.
16	·40	43·6	22·0	94·9	37·2	36·0	89	5		N.E.
17	·15	40·7	34·5	89·5	34·4	33·1	86	10		N.
18	.34	36·2	27·4	74·3	33·9	32·3	83	10	·04	N.
19	·19	37·2	29·5	72·1	34·7	33·3	85	10	·04	N.
20	·21	35·4	29·5	63·4	31·2	30·2	86	10		N.
21	·25	39·9	17·8	94·7	31·9	31·6	96	6	·05	N.E.
22	·22	43·9	31·3	92·1	39·5	38·4	91	10	trace	N.W.
23	·09	44·4	35·5	78·2	41·3	39·1	83	10		N.W.
24	30·00	46·3	37·6	82·9	41·2	39·6	87	10		S.W.
25	29·72	51·9	35·5	111·1	43·2	41·2	92	8		S.W.
26	·51	45·1	38·2	105·4	42·7	39·7	77	10	·40	S.W.
27	·22	49·4	39·7	84·2	43·5	43·1	97	10		S.W.
28	29·53	51·4	36·8	99·1	44·7	42·9	86	10	·37	S.W.
Mean	30·00	40·1	29·4	82·5	35·5	34·4	88	8·6	Total 1·63	
Mean for 19 Years	30·01	45·3	32·2	75·2	37·9	36·8	89	7·8	1·83	

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MARCH.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·07	53·1	35·5	105·4	49·3	46·5	80	6	·16	S.W.
2	·11	53·7	34·3	100·9	43·1	42·9	98	10	·22	S.
3	·29	48·1	35·3	100·3	43·2	40·1	77	7	·04	S.W.
4	·73	54·1	34·8	93·3	42·1	41·9	98	10	·10	S.W.
5	·57	55·5	41·7	109·1	49·7	49·0	95	10	trace	N.W.
6	·41	46·4	38·4	98·1	44·4	42·9	88	10	·21	S.W.
7	·25	48·9	38·5	96·4	46·1	41·4	80	8	·17	N.E.
8	29·74	46·1	36·1	90·4	42·9	40·2	79	10	trace	N.E.
9	30·25	42·4	32·5	87·1	39·4	37·4	84	10		N.E.
10	30·20	43·7	27·7	89·7	37·5	33·8	71	5		S.W.
11	29·84	46·7	24·2	83·2	33·7	31·6	79	8		N.
12	29·96	54·1	32·6	91·9	45·9	43·9	85	8		W.
13	30·05	40·1	29·9	74·0	35·2	34·6	96	10		N.E.
14	29·88	47·1	34·3	74·6	38·7	37·1	86	10		N.E.
15	·72	41·4	35·8	72·0	38·9	37·7	89	10	·04	N.E.
16	·70	43·9	35·1	72·3	38·4	37·5	92	10		N.
17	·74	48·9	37·5	89·2	40·7	38·7	84	10	trace	S.E.
18	·57	42·1	37·9	79·7	38·4	37·1	88	10		N.E.
19	·52	41·9	34·3	91·3	38·5	34·1	66	10	·22	N.E.
20	·50	40·5	32·8	76·0	37·1	36·6	95	10	·12	E.
21	29·78	42·1	35·5	74·0	40·1	35·8	68	8		N.E.
22	30·24	44·4	28·4	101·9	38·7	35·1	71	10		N.E.
23	·44	42·1	32·3	88·9	39·7	37·1	79	10		N.E.
24	30·29	43·9	26·4	103·9	37·1	34·6	79	10	·02	N.
25	29·83	41·7	28·6	87·7	33·9	33·0	90	10	·03	N.E.
26	·95	37·9	22·8	96·4	34·7	34·4	96	3		N.E.
27	·70	38·9	23·8	94·5	36·1	36·0	99	5		N.
28	·70	40·9	22·5	98·9	34·7	32·3	77	5	trace	N.
29	·77	43·9	19·7	103·4	39·1	35·6	73	4	·18	S.W.
30	·17	49·4	35·1	90·5	43·7	43·1	95	10	·31	S.W.
31	29·19	50·1	41·2	104·7	43·1	42·9	98	10	·03	S.W.
Mean	29·71	45·6	32·4	87·7	40·1	38·2	85	8·6	Total 1·85	
Mean for 19 years	29·89	49·0	32·9	89·9	41·1	39·1	84	7·2	1·65	

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APRIL.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/°	0—10	In.	
1	29·57	52·9	33·8	114·5	47·3	41·9	65	6		S.W.
2	·99	53·1	30·3	110·4	48·5	43·7	68	10	·08	S.W.
3	·63	57·1	47·4	101·1	52·1	51·8	97	10	·58	S.W.
4	29·81	50·1	40·0	110·9	44·1	42·1	84	9		N.
5	30·04	48·5	33·3	89·1	41·1	39·1	84	10	·12	S.E.
6	29·78	53·6	30·3	81·2	43·4	43·1	82	10	·03	S.W.
7	·69	61·8	42·6	118·9	52·2	49·8	83	10	·07	W.
8	·59	54·6	43·4	109·7	53·1	45·6	57	5	·10	S.W.
9	·66	56·1	40·5	117·5	49·7	44·9	69	2	·20	S.W.
10	·39	50·7	37·7	110·1	44·7	44·1	95	10	·28	S.
11	·39	51·1	38·7	113·4	44·2	42·9	89	10	·07	S.
12	·78	49·9	32·3	100·9	44·1	40·7	76	10	·04	N.E.
13	·90	49·9	33·3	95·9	40·1	39·4	95	10	·20	S.W.
14	·57	55·7	35·5	95·9	45·7	43·1	81	10	·04	S.W.
15	·46	56·1	39·2	106·9	44·7	39·1	62	8	·12	S.W.
16	29·47	52·3	35·8	107·1	45·7	41·1	68	10	·07	S.W.
17	30·19	55·5	32·3	109·9	45·9	41·2	68	10		S.W.
18	·26	59·0	38·2	104·4	54·9	44·1	98	4		S.W.
19	·19	63·0	33·5	114·7	58·2	48·8	51	0		S.W.
20	30·01	67·4	41·2	119·1	62·1	50·3	45	0		S.
21	29·91	68·9	45·7	120·4	61·7	53·5	57	0		S.W.
22	·85	70·7	38·7	124·2	65·1	53·5	90	5		N.E.
23	29·91	73·9	42·7	124·4	67·4	55·2	45	0		N.E.
24	30·00	73·9	42·2	120·7	68·9	56·2	44	0		N.E.
25	29·91	65·0	42·7	120·5	60·5	52·2	56	3		N.
26	·91	58·0	43·4	111·9	54·9	45·2	48	0	trace	N.
27	·86	51·4	34·3	115·7	45·1	41·7	76	10	trace	N.W.
28	·91	53·4	28·5	108·9	43·7	39·3	70	8		N.
29	·86	58·0	28·8	117·9	52·1	44·2	55	0		S.E.
30	29·98	60·0	35·1	109·1	49·9	46·7	78	10		S.E.
Mean	29·82	57·7	37·4	110·2	51·0	45·5	71	6·3	Total 2·00	
Mean for 19 years	29·89	55·9	36·8	100·5	47·8	44·4	78	7·0	1·42	

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MAY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/°	0—10	In.	
1	30·10	62·0	36·8	114·7	59·5	51·8	59	4		S.E.
2	·08	56·1	44·7	107·1	49·4	49·2	99	10		N.E.
3	·35	65·5	43·4	123·1	54·9	51·8	80	6		N.E.
4	·33	60·5	34·3	115·9	54·4	50·8	77	0		N.E.
5	30·06	58·8	31·3	114·1	44·9	42·2	80	10		N.W.
6	29·61	53·4	41·4	113·1	46·5	44·1	82	10	·01	N.W.
7	·32	55·2	40·4	119·7	50·9	45·9	68	10	·02	N.W.
8	·40	51·1	35·9	106·1	44·1	41·2	85	10	·16	S.
9	29·80	54·9	37·5	102·1	47·2	45·4	87	10	·47	N.E.
10	30·02	56·1	40·7	111·1	46·7	45·2	89	10	trace	N.
11	·18	57·5	41·4	112·9	55·4	49·0	63	10		N.
12	·38	63·8	36·3	112·7	57·7	52·4	69	0		S.E.
13	·34	64·8	42·4	113·4	51·7	47·6	74	5		N.E.
14	·33	69·9	39·8	117·7	59·1	52·2	62	0		N.E.
15	·32	68·7	37·2	117·9	62·1	51·5	48	0		N.E.
16	·22	58·8	39·4	121·9	52·1	46·1	63	6		N.E.
17	·20	54·9	35·5	113·1	47·7	47·2	96	10		N.E.
18	·26	62·6	32·8	117·3	56·1	49·8	64	10		N.E.
19	·17	69·5	39·5	124·4	57·9	54·5	80	0		N.W.
20	·29	66·6	45·2	115·1	56·7	52·2	73	10		S.E.
21	·36	67·2	37·4	115·9	58·9	54·2	73	10		N.E.
22	·31	67·9	42·7	115·1	64·9	56·8	59	0		S.E.
23	·35	67·4	43·0	119·7	63·4	52·2	47	0		N.E.
24	·32	69·9	42·4	119·4	61·7	52·8	55	2		S.E.
25	30·18	68·9	43·4	123·2	62·3	54·8	61	0		N.E.
26	29·94	62·0	46·1	116·1	50·0	48·7	91	10		N.E.
27	29·92	69·9	37·5	134·3	61·3	55·4	67	3		S W.
28	30·07	78·2	41·5	134·0	68·1	58·2	53	0	trace	S.
29	29·83	81·2	48·9	139·0	76·9	66·1	53	5		S.W.
30	·76	65·1	56·2	122·1	64·5	60·2	76	10	·10	S.W.
31	29·75	66·3	55·0	126·2	61·2	56·2	71	8		S.W.
Mean	30·08	63·7	41·0	118·0	56·4	51·2	71	5·8	Total ·76	
Mean for 19 years	29·96	61·9	42·5	109·2	54·2	49·9	74	6·7	1·66	

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JUNE.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/°	0—10	In.	
1	29·91	67·6	45·4	128·2	63·2	57·4	68	7	·01	S.W.
2	29·89	65·6	52·0	119·5	59·3	57·7	90	8		S.W.
3	30·12	65·8	48·6	122·9	57·9	54·6	81	10	.20	S.W.
4	·15	68·9	48·3	123·9	52·4	52·2	99	10		S.W.
5	·15	70·1	46·6	132·0	62·7	58·4	76	8		N.W.
6	·22	70·2	54·6	122·2	63·9	60·9	82	8		N.E.
7	·31	68·0	39·8	122·7	62·7	54·2	56	6		N.E.
8	30·14	72·1	41·7	120·9	60·2	54·0	65	10		N.E.
9	29·95	78·1	39·9	130·0	68·4	56·2	46	0		S.
10	30·01	67·4	49·3	133·3	61·2	56·3	72	6		N.W.
11	30·03	67·1	46·2	125·1	59·9	51·5	56	6		N.
12	29·88	63·0	47·1	122·7	58·1	51·3	62	10	·20	N.W.
13	·65	56·9	39·4	119·1	53·1	47·5	65	10	·05	N.E.
14	29·70	65·1	47·3	124·9	56·7	50·2	63	6		N.E.
15	30·03	62·2	37·6	119·7	57·2	51·2	66	8		N.W.
16	·03	63·9	46·6	124·6	55·9	53·8	87	8	·10	N.W.
17	·05	60·3	46·3	124·1	54·1	49·3	70	10		N.
18	·04	63·0	44·2	129·0	53·1	49·0	74	10		N.E.
19	·20	67·4	36·1	112·2	62·2	57·2	72	5	·06	N.E.
20	·13	66·0	49·3	119·3	58·4	57·9	97	10	·02	N.E.
21	·10	74·2	56·8	135·4	64·9	61·1	78	6	·06	S.W.
22	30·02	75·9	55·2	132·6	69·4	64·9	76	8	trace	S.W.
23	29·77	66·8	57·6	125·1	60·2	55·7	74	10		S.W.
24	30·30	67·4	46·1	131·6	60·9	52·3	55	10		N.W.
25	·42	70·7	40·7	130·0	61·7	54·8	63	10		N.W.
26	·42	72·9	43·2	125·1	66·0	56·3	53	0		N.E.
27	·31	75·2	43·2	119·1	67·1	58·4	58	0		S.
28	·19	75·4	44·8	124·1	66·7	58·9	60	6		S.
29	·13	76·3	45·0	127·8	72·1	61·7	53	2	·31	N.E.
30	30·02	65·8	52·6	115·4	58·9	58·2	95	10	·60	E.
Mean	30·08	68·3	46·4	124·7	60·9	55·4	70	7·3	Total 1·61	
Mean for 19 years	30·02	68·4	47·5	116·6	60·3	55·7	75	6·9	1·67	

JULY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·78	68·4	57·3	113·4	58·9	58·7	99	10		S.E.
2	·64	69·1	54·3	118·4	67·7	61·7	69	10	·47	N.E.
3	29·77	71·9	52·2	122·9	67·9	61·4	67	10		N.E.
4	30·07	77·1	54·5	125·9	63·9	60·2	78	8		N.
5	·15	79·7	55·3	132·8	71·9	64·7	64	2		N.W.
6	·16	70·9	58·1	125·6	68·3	63·4	74	10		N.E.
7	·24	67·9	55·8	117·9	58·9	56·7	86	10		N.E.
8	·25	75·2	44·5	126·1	66·2	60·4	69	8		N.E.
9	·11	76·1	46·6	123·9	67·5	60·7	65	0		N.E.
10	·10	81·2	48·1	128·1	72·4	63·9	59	0		N.E.
11	·14	84·7	50·8	133·9	79·1	67·6	52	0		N.E.
12	·14	81·1	56·0	124·9	76·3	68·1	62	0	·12	N.W.
13	·14	67·2	57·5	113·4	63·9	59·9	77	10	trace	N.E.
14	·07	69·2	49·1	126·1	60·1	55·7	74	5		N.E.
15	·06	75·5	50·5	131·0	66·7	60·9	69	5		N.E.
16	·22	78·9	48·4	136·6	73·7	66·4	65	5		N.E.
17	·31	80·9	49·3	142·0	73·4	63·9	57	6		S.
18	·27	87·0	59·3	136·4	80·7	68·0	48	0		N.E.
19	·17	88·0	53·2	139·8	80·1	67·6	48	0		N.E.
20	30·16	86·3	56·2	135·0	80·9	67·6	47	0		N.E.
21	29·92	83·4	53·5	133·8	72·6	66·4	69	7		S.W.
22	·90	70·9	57·3	124·1				8	·04	S.W.
23	·91	67·7	52·2	117·9	57·7	57·5	99	10	·15	S.W.
24	·58	69·4	54·2	123·1	58·9	58·9	100	10	·12	S.W.
25	·60	69·2	51·3	126·9	59·4	57·7	89	10	·21	S.W.
26	·68	62·3	56·0	122·1	57·2	57·1	99	10	·42	S.W.
27	·73	67·2	54·4	117·4	59·9	58·7	92	10	·40	S.E.
28	29·84	71·2	50·0	128·0	63·3	59·7	79	8	·12	S.E.
29	30·08	74·7	48·3	129·1	65·7	63·7	88	0	·17	S.E.
30	·24	79·4	53·0	131·8	71·1	69·3	90	2		S.W.
31	30·29	75·4	55·3	128·6	72·6	71·1	91	10		N.
Mean	30·02	75·1	53·0	120·5	67·9	62·6	74	5·9	Total 2·22	
Mean for 19 years	29·99	70·8	51·3	118·1	63·0	58·5	76	6·9	2·24	

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AUGUST.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	10—0	In.	
1	30·18	84·1	55·3	121·9	64·2	62·1	87	10		N.
2	·26	72·2	52·5	126·9	65·4	61·7	74	10		N.E.
3	·33	72·4	50·0	124·5	57·9	55·2	83	0		N.E.
4	·06	64·0	52·4	112·9	63·1	58·2	73	10	trace	S.W.
5	30·09	65·3	45·4	120·2	61·9	56·0	88	10	·07	S.W.
6	29·83	71·4	51·3	123·1	61·1	60·1	94	10		W.
7	30·07	75·2	47·1	126·7	67·1	59·9	63	8		S.W.
8	·09	75·1	60·4	131·8	69·4	64·1	73	10		S.W.
9	30·03	81·4	52·3	129·1	70·2	64·4	70	8		S.W.
10	29·68	79·1	56·0	131·6	75·3	67·5	62	5		S.W.
11	·96	68·9	44·2	126·4	63·9	58·2	69	7	·16	S.W.
12	29·89	66·4	46·9	128·1	62·1	57·5	74	5	trace	S.W.
13	30·07	67·6	48·8	121·9	63·2	59·3	78	5		S.W.
14	30·04	65·6	55·5	93·5	65·4	62·6	84	10	·47	S.
15	29·83	70·9	54·0	128·3	60·5	59·1	91	8	·01	N.W.
16	30·14	69·1	47·3	130·0	62·3	57·0	71	5		S.W.
17	·23	70·4	46·6	123·7	67·2	58·3	57	7		S.W.
18	·14	81·6	50·2	129·1	70·4	62·4	61	2		S.W.
19	·29	77·9	50·4	124·4	68·7	64·2	76	0		N.W.
20	·43	71·1	51·0	124·7	63·6	57·2	66	5		N.E.
21	·42	74·7	45·2	121·1	65·3	58·9	66	7		S.E.
22	·36	74·4	41·5	118·4	64·2	59·4	73	8		S.E.
23	·30	75·1	42·9	120·2	59·4	57·2	86	10		S.
24	30·20	78·2	44·5	119·4	69·9	64·9	74	0		S.W.
25	29·90	82·7	46·3	131·8	68·1	62·9	72	0	·64	S.W.
26	·50	61·0	49·4	129·1	56·2	51·5	72	4	·04	S.W.
27	·84	61·1	45·4	122·1	54·4	49·8	71	10	·83	N.W.
28	29·91	63·0	43·4	121·9	54·9	49·2	66	8		S.W.
29	30·10	66·6	47·4	124·7	57·1	51·3	66	8		S.W.
30	·10	66·3	56·2	123·1	65·9	59·2	65	9		S.W.
31	30·04	65·8	53·0	117·4	62·9	59·4	80	10	·26	S.W.
Mean	30·07	71·6	49·4	123·5	63·9	59·0	74	6·7	Total 2·48	
Mean for 19 years	29·95	70·3	50·8	117·8	62·2	58·2	77	6·8	2·11	

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SEPTEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/°	0—10	In.	
1	30·08	63·8	50·5	116·4	56·4	52·6	76	10		S.W.
2	·13	62·0	41·5	110·1	58·3	52·2	66	10		N.E.
3	·09	63·8	49·3	113·4	58·5	52·2	64	10		N.E.
4	30·01	64·3	48·3	117·6	60·1	52·2	59	10		S.
5	29·88	63·8	44·0	114·9	57·9	52·3	68	8		N.E.
6	·83	67·2	39·9	124·1	58·4	53·6	72	5		S.W.
7	·93	70·4	47·1	121·2	61·7	57·4	75	5		S.E.
8	·89	71·9	54·4	117·7	62·9	59·7	81	10	·32	S.W.
9	29·92	70·1	58·4	122·9	62·3	61·1	93	8		S.W.
10	30·01	68·9	51·3	130·0	59·4	57·9	90	10		S.W.
11	·08	69·1	48·3	123·1	59·1	55·6	79	10	·08	N.E.
12	·03	65·0	45·0	123·7	57·7	56·0	89	10		N.E.
13	30·00	61·8	47·1	118·2	57·2	55·0	86	10		N.E.
14	29·83	63·2	47·6	115·1	58·4	54·6	77	10		S.W.
15	·86	63·8	47·3	120·7	54·5	52·0	82	10	·59	S.W.
16	·81	63·6	35·8	111·9	56·1	52·2	76	10	·12	S.E.
17	29.44	65·0	53·2	114·7	60·4	60·4	100	10		S.W.
18	30·07	64·8	48·1	114·5	57·5	50·6	61	10	·01	S.W.
19	29·91	63·0	42·4	119·9	55·4	52·3	81	10	·15	S.
20	·52	67·1	54·0	113·9	62·4	59·4	82	10	·02	S.
21	·48	64·8	56·9	105·2	62·1	60·2	88	10		S W.
22	·56	68·2	51·0	126·1	59·3	57·1	86	8		S.
23	·50	67·2	56·0	119·9	62·5	59·9	84	10		S.
24	·85	68·9	51·0	116·2	63·9	60·1	78	6		S.
25	29·91	70·5	51·2	119·4	67·1	60·5	66	5		S.
26	30·11	65·1	50·6	117·1	59·4	53·2	65	0		S.
27	·29	64·1	42·0	110·9	61·1	57·1	76	10		S.W.
28	·31	65·8	56·2	101·7	60·7	57·7	82	10		S.W.
29	·24	72·7	50·2	117·9	55·5	54·7	94	10		S.E.
30	30·14	69·9	41·2	115·9	59·1	54·2	72	5	trace	S.E.
Mean	29·92	66·3	48·7	117·1	59·5	55·8	78	8·7	Total 1·29	
Mean for 19 years	30·02	65·6	47·7	109·3	58·1	55·2	82	7·0	1·92	

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OCTOBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	30·03	72·2	53·0	122·1	66·7	62·7	78	2	·29	S.E.
2	29·85	67·9	56·2	118·4	61·1	61·1	100	10		S.
3	30·05	66·8	45·7	116·9	60·9	55·8	71	2	·50	S.E.
4	29·97	56·5	49·0	111·7	55·4	55·4	100	10	·12	N.E.
5	·92	56·1	36·1	106·9	53·1	49·3	75	10	trace	W.
6	·39	59·8	42·9	102·9	51·1	49·3	88	10	·07	S.W.
7	·66	59·8	39·4	111·9	49·4	44·1	66	8	trace	N.
8	·66	58·8	39·5	117·1	49·5	48·2	91	10	·07	S.W.
9	29·71	59·8	48·6	107·1	57·1	51·0	65	6		N.W.
10	30·19	60·6	32·3	109·9	52·7	49·6	80	0	·01	S.W.
11	·18	55·4	45·4	89·9	52·4	52·2	99	10		N.E.
12	·09	58·0	47·2	87·7	55·1	53·8	91	10		S.
13	30·12	59·2	45·9	105·1	52·4	51·5	94	5		S.E.
14	29·94	55·5	36·6	94·7	45·7	45·1	95	8		N.W.
15	·80	56·1	43·4	97·1	54·1	48·8	68	2	·04	S.
16	·60	59·1	42·7	98·9	52·7	52·6	99	10	·91	S.
17	·45	60·1	47·3	112·7	56·1	52·8	80	8	·16	S.W.
18	·35	56·4	49·2	109·9	55·1	54·8	98	10	·40	S.E.
19	·65	58·8	38·7	110·1	54·2	51·2	80	5	·01	S.W.
20	·84	58·0	33·3	110·4	47·7	46·9	94	0		S.W.
21	·71	56·1	28·9	102·7	39·7	39·7	100	5	trace	N.W.
22	29·80	51·7	35·1	100·2	51·2	48·5	81	10	trace	S.
23	30·02	54·1	36·8	106·1	44·9	44·7	98	8		S.
24	·01	54·5	35·1	100·4	49·2	47·5	88	10	·03	S.
25	·05	54·1	34·8	102·7	45·7	45·2	96	10	trace	S.W.
26	·13	53·4	28·2	100·1	45·1	43·5	87	0		S.
27	·32	57·1	28·4	100·5	42·9	41·7	90	5	trace	S.W.
28	·19	60·1	41·7	109·4	53·5	51·0	83	10		S.W.
29	·01	55·4	50·3	105·9	53·1	52·0	93	10	·02	S.W.
30	·22	54·7	48·1	102·4	50·1	48·3	88	10		N.E.
31	30·26	56·1	42·2	96·9	51·4	45·5	64	5		N.E.
Mean	29·91	58·2	41·4	105·4	51·9	49·8	86	7·1	Total 2·63	
Mean for 19 years	29·91	56·3	40·8	93·7	49·2	47·3	88	7·1	2·98	

NOVEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	30·26	50·1	41·2	117·1	47·4	44·7	80	5		N.E.
2	·35	54·5	39·2	98·6	49·1	45·1	73	2		S.E.
3	·34	42·4	26·2	87·1	33·4	33·3	98	10	trace	N.W.
4	·30	36·9	25·4	51·9	29·7	29·2	91	10	trace	N.W.
5	·40	36·7	29·6	50·4	34·1	34·0	99	10		N.W.
6	·29	42·5	26·9	81·2	30·4	30·3	98	10		N.W.
7	·24	48·9	29·4	86·9	42·1	42·1	100	10		N.W.
8	·18	51·4	41·2	92·4	47·7	46·7	92	5		N.E.
9	·18	58·3	34·6	88·7	45·1	43·1	84	10		N.E.
10	30·09	51·3	43·6	59·9	47·7	44·9	80	10		S.W.
11	29·84	54·9	45·8	70·8	50·2	48·0	85	10	trace	W.
12	·33	52·0	48·1	68·8	50·5	48·4	86	10	·11	S.E.
13	·08	47·1	43·2	66·1	46·2	45·9	98	10	·24	S.W.
14	·40	39·9	33·3	87·9	37·7	36·8	92	8		N.E.
15	29·58	42·5	20·5	84·1	31·9	31·1	89	6		N.E.
16	30·04	38·9	16·9	80·9	28·7	28·3	92	0		S.W.
17	·35	45·1	18·5	84·2	26·4	26·4	100	0		S.W.
18	·33	51·7	25·4	80·5	42·9	41·6	99	10	trace	S.W.
19	·16	52·2	41·7	76·8	51·2	51·2	100	10		N.W.
20	30·01	53·4	48·1	74·8	52·9	51·8	92	10		S.W.
21	29·85	54·2	46·3	73·0	51·2	49·0	85	10	·06	S.W.
22	29·92	44·9	37·4	70·8	43·1	42·9	98	10	·03	N.E.
23	30·42	43·1	26·5	85·2	35·1	32·0	72	10		N.E.
24	·53	41·1	21·0	78·7	24·4	24·2	95	0		N.
25	·55	41·1	21·2	78·9	28·7	27·8	84	0	·01	N.
26	·47	42·5	26·4	76·0	39·7	38·7	92	8	trace	N.
27	·39	46·2	34·3	72·0	42·1	41·7	97	10		N.
28	·32	46·1	38·4	79·7	44·6	42·9	87	10		N.W.
29	·47	53·1	27·7	84·9	36·7	35·3	87	8		N.W.
30	30·43	46·9	35·8	90·1	45·2	42·7	82	6		S.W.
Mean	30·14	47·0	33·1	79·3	40·5	39·3	90	7·6	Total ·45	
Mean for 19 years	29·96	49·6	37·3	75·6	43·5	42·5	92	8·0	2·58	

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DECEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In	°	°	°	°	°	°/₀	0—10	In.	
1	30·28	48·2	39·8	84·7	44·1	41·9	83	8		S.W.
2	·28	52·7	43·2	85·9	47·1	44·9	84	3		S.
3	·26	45·9	40·5	84·2	42·7	41·5	90	10		S.W.
4	·37	41·7	26·4	81·2	32·7	31·3	82	10		S.W.
5	·13	43·2	27·7	78·4	39·4	38·1	89	10		S.W.
6	·20	53·7	28·4	85·9	38·4	37·9	95	8		S.W.
7	30·01	54·9	37·4	83·1	53·1	52·0	93	10	·18	S.W.
8	29·63	53·1	50·0	58·9	52·3	51·8	96	10	·10	W.
9	·59	53·3	40·2	63·7	42·4	40·1	82	10	·12	N.W.
10	·75	41·9	31·8	76·3	36·7	35·0	85	2	·01	N.W.
11	·66	42·2	32·6	81·1	38·1	36·0	82	3	·30	N.W.
12	29·34	46·1	29·5	79·9	39·3	39·1	98	10	·86	S.
13	28·89	42·9	38·4	77·9	41·7	41·4	97	10	·11	N.E.
14	29·31	40·4	39·2	75·1	39·7	37·7	84	10	·03	N.E.
15	·81	37·7	29·2	78·7	30·3	29·0	80	0	trace	N.E.
16	·50	40·7	29·4	77·5	37·5	36·2	88	6		S.
17	·77	41·2	23·0	78·9	29·7	29·3	93	10	·09	S.
18	·41	45·3	28·6	76·0	34·4	33·7	92	10		S.
19	·37	40·9	25·4	78·4	26·7	26·7	100	10	trace	S.
20	·56	34·7	22·0	68·1	27·7	27·4	94	10		S.
21	·56	33·1	25·9	62·9	32·1	31·0	86	10		S.W.
22	·37	32·9	25·5	52·2	29·5	29·1	93	10		N.E.
23	·67	41·2	18·5	50·4	23·1	22·9	94	5	·34	S.
24	29·06	41·9	22·3	49·2	38·4	37·4	91	10	·74	S.
25	28·79	39·3	31·3	81·1	34·7	34·4	96	10		S.W.
26	29·16	40·2	31·3	79·1	36·7	36·0	94	10		S.W.
27	·23	41·1	26·7	80·1	31·9	31·3	91	3	·03	S.W.
28	·45	47·4	26·9	75·1	40·7	40·4	98	10	·46	S.W.
29	·28	53·1	39·2	82·9	41·5	41·1	97	5	·37	S.
30	·60	54·9	40·2	76·0	51·9	51·3	96	10	·07	S.W.
31	29·95	52·9	50·0	75·8	51·7	51·2	96	10	·04	W.
Mean	29·62	44·5	32·3	72·5	38·3	37·3	91	8·2	Total 3·85	
Mean for 19 years	29·92	44·2	32·8	64·2	38·4	37·5	91	8·0	2·40	

Total rainfall for the year, 22·09 in.

Mean for 19 years, 24·58 in.

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FIELD CLUB SECTION.

I am glad to be able to say that the interest in the Field Club has been well sustained, it is true that the numbers who joined in the excursions were in some cases rather lower than usual, but this fact is by no means to be deplored, the enthusiastic ones being keen to the end of the season, while those whose enthusiasm waned were discouraged from taking part.

One great feature in the year's work was the increase of note books, containing records of finds and original observations, and I trust that this will be still more marked next year; to the field naturalist, if he wants to be accurate, the note book is indispensable, not only is it useful as a book of reference for the future, but the habit of keeping it is a great aid in making one see, record and think out details more accurately than would otherwise be the case.

There is nothing of very great interest to notice in the natural history record of the year, with the exception of the appearance of the Pine Grosbeak (Loxia Enuncleator, *Pennant*), which, as will be seen in the Ornithological Report, has been noticed by several observers; this bird is rarely seen in this country. The Geologists have made an interesting find of flint implements on the Ridges.

The following took charge of the various Sections and formed a Selection Committee: Mr. FitzGerald (Botany, Conchology &c.); Mr. Blundell (Geology); C. M. Rogers (Ornithology and Oology); C. T. Brookes (Entomology).

EXCURSIONS.

Saturday, May 18th.

The first meeting of the Field Club was well attended, as many as 44 going to Shalford. The Ornithologists necessarily from the time of year formed the larger proportion of the

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members present. The lunch having been sent on by a trap in advance, we all made our way to the Echo Pit, a larged wooded, disused chalk pit, admirably suited for the purpose. After lunch the party was photographed and then dispersed to explore the neighbouring woods and thickets. The vigorous beating of the hedges produced a few eggs, none rare, and an irate keeper who was subsequently appeased. The ornithological results were, on the whole, disappointing, especially in view of the promising appearance of the locality. It was of course too early for the entomologists to expect much. After an energetic, but not very productive, afternoon we met at the Hotel in Shalford, in the garden of which we found tea waiting for us. After this we had little time before our train went, so made our way to the station, thus concluding a most pleasant day's outing.

Saturday, June 15th.

A party of 33 trained to Ash, from there the geologists bicycled and the rest drove to Sands; after lunching in the fir wood, Crooksbury Common was explored, but the afternoon was not a very productive one; the geologists being the best pleased, having found out some flint implements, which had been discovered by some workmen.

Saturday, July 6th.

A small party started by the 11.57 train to Reading and went on to Goring, the geological section having set off by an earlier train to Didcot. We lunched in the Rectory garden, thanks to the hospitality of the Rev. L. Wallace, and afterwards made our way through Streatley, keeping to the left up to the downs, finally arriving at Cholsey, where the geologists joined us, a good tea being provided at the Railway Hotel. The entomologists were delighted at finding the Marbled White butterfly in considerable quantities, although the various Blues, which are well known in the locality, were rather scarce, this may be accounted for by the afternoon clouding over and the fact that a fair wind was blowing.

It was unanimously voted that the locality was one of the most favourable that we had visited and the excursion one that would bear repetition.

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Saturday, July 20th.

The Hog's Back had been previously visited by the Field Club, but early in the season, when it was found to be not very productive, so our visit there this year was made as late as possible. We trained to Wanborough, a cart meeting the train to convey lunch to the beech wood at the top of the hill; the geologists detrained at Aldershot and did not reappear till tea time. Both from the botanical and the entomological points of view the locality was fairly good, the best spot being Mr. Julian Sturgis's chalk pit; we met for tea in the park at Puttenham, and after tea wandered about again, meeting at Wanborough station at 7.30, arriving at the College at 8 p.m. when we bathed and finally dispersed. This was the last field day of the season which on the whole has been very successful.

I regret that I cannot give the principal and most interesting captures of each of the above field days, but unfortunately these are not to hand when writing the accounts. Will the Secretaries of the various Sections take note of this for next year.

H. PUREFOY FITZGERALD.

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BOTANICAL REPORT.

Botanical members as usual were very few, this is disappointing; the flowers are so nearly connected with the study of Entomology that I think they ought to be taken more into account; let us hope that more interest will be taken in future. There is nothing new in the way of flowering plants to be recorded, but I have started a list of fungi to be found in and near the College grounds; many others besides these are to be found, but they are somewhat difficult to name; those, however, that are included I am sure of, many have been named by authorities and small as the list is now, it can easily be expanded in future seasons. For some of them I am indebted to Mr. A. S. Forster.

FUNGI.

Scleroderma vulgaris
Auricularia mesenterica
Lycoperdon pyriforme
Sparassis crispa (Cox's wood and Bigshotte Rayles, very excellent eating)
Thelephora laciniata
Calocera viscosa
Stereum hirsutum
,, purpureum
Hydnum repandum
Daedalea quercina
Polyporus (Polystictus) versicolor
,, ,, abietinus
Fistulina hepatica
Boletus badius
,, Edulis
,, flavus
,, variegatus
,, scaber
,, chrysenteron
Coprinus micaceus
Psilocybe spadicea

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Stropharia aeruginosa
,, Percevali
,, semiglobata
Paxillus involutus
,, atrotomentosus
Clitopilus prunulus
Cantharellus aurantiacus
Laccaria laccata
Pleurotus chioneus
Lactarius turpis
,, deliciosus
,, rufus
Russula furcata, var ochroviridis
,, fragilis
Mycena epiterygia
Collybia semitalis
,, butyracea
,, maculata
Tricholoma sordidum
,, album
,, nudum
,, flavobrunneum
,, rutilans
Armillaria bulbigera
Amanita muscaria
,, rubescens
Hygrophorus virgineus
Gomphidius viscidus

H. PUREFOY FITZGERALD.

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ORNITHOLOGICAL REPORT.

The most interesting feature of the year is the appearance of a Pine Grosbeak here, first seen on Nov. 17th. On that day Mr. Perkins reported he had seen out of his window, to all appearances, a male specimen of this very uncommon but beautiful bird, sitting in a beech tree, being mobbed by sparrows. The next day I saw what probably was the same bird, by the Music School, again being mobbed by sparrows. Its plumage was brilliant, being almost salmon in colour, with brown tail and wing coverts. I noticed his flight was strong and rather undulating. Since then it has been seen three times by P. Hagreen who saw it on Nov. 20th and Dec. 8th, and agrees that its flight was strong. On each occasion he saw it in a Pine tree below Dr. Armstrong's garden; he also noted that it uttered a discordant note when flying away.

With regard to the nesting season, several nice finds were made, though nothing really startling. Mr. Tomlinson has proved himself a great addition to our small band of ornithologists, and his efforts have been crowned with good success. To his collection he has added more than one Nightingale, Butcher Bird, and Willow wren. J. W. Best found a Kingfisher's nest at Kingsmere. The Lesser spotted Woodpecker's nest was found by some members of Purnell's House. Snipe again lived at Blackwater, and I found a Grey Wagtail's nest in a Willow tree there. Nightjars returned in greater numbers than they have done for years. The Field Club Excursions yielded nothing good, but this is not to be wondered at, owing to the difficulties in finding places where the land owners will give leave for a not very small body of nest hunters to roam where they will. However an Excursion to the Thames with Mr. Blundell yielded several Little Grebe's nests.

The following eggs have been presented to the local egg collection.

1 Night Jar (P. H. Bailey).
1 Bullfinch ,,
2 Willow Wrens ,,
1 Nightingale (Mr. Tomlinson).
1 Shrike ,,
1 Meadow Pipit ,,
1 Golden Crested Wren (C. T. Brookes).
1 Spotted Flycatcher ,,

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1 Redstart (H. Symons).
1 Goldfinch ,,
3 Little Grebes (C. M. Rogers).
1 Nightingale ,,
2 Tree Pipits ,,
1 Garden Warbler ,,
1 Sedge Warbler ,,
2 Blackbirds (deformed) ,,
1 Tree Pipit ,,
2 Long tailed Tit ,,
2 Marsh Tit ,,
2 Chiff Chaff ,,
1 Rock Dove ,,
1 Shrike ,,

I cannot close these notes without expressing a hope that the cruel and unnecessary process of tearing out and destroying nests, which is only too prevalent here among the younger boys, will ere long be stamped out by the combined action of members of the Field Club, who if they know of such things being done ought either to stop them, or to ask the Head of the Field Club to do so. Unless they do this they must remember that they are not performing their duty as Members of the Field Club, that they are abusing the privileges which they gain by it, and will no longer have any right to be counted as members.

C. M. ROGERS.

Mr. Davenport sends the following "Bird notes."

Jan.	1.	Blackbird	voice.	
		Thrush	,,	
Feb.	23.	Lark	,,	
March	10.	Wood Pigeon's eggs.		(G. Goulding and F. H. Huleatt).
March	17.	Owl's nest, and eggs.		Cox's Wood (C. M. Rogers.)
,,	,,	Thrush's egg.		(G. Goulding).
,,	22.	Tree Creeper's nest		,,
April	11.	First Swallow.		
,,	21.	Cuckoo first heard.		
,,	,,	Nightingale heard.		
May	2.	Night-jar,	arrival	(J. E. Murray).
,,	7.	Swift	,,	(C. M. Rogers).
Oct.	9.	Last swallow seen.		

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GEOLOGICAL REPORT.

On March 16th the sections shown at Winchfield by the widening of the South Western line were examined, but were not as clear as on the previous visit.

On March 23rd a small party went to Gomshall by rail and found a few fossils in the pits on the escarpment above the village. On reaching the brickfield in the Gault near the railway numerous fossils were found on the weathered heaps, among them, Belemnites minimus, Inoceramus sulcatus, Hamites attenuatus, Ammonites interruptus, Nucula pectinata, Cardita tenuicosta, Serpula, and Pentacrinus. No shark's teeth which are often found here were seen.

On May 18th the geologists, with the rest of the Field Club, went by rail to Shalford and found a few fossils in the large chalk pit known as the Echo Pit. Leith Ross obtained some fish vertebrae, and the others several Micraster and Spondylus spinosus. The next pit to the East contained numerous Terebratula at a slightly higher horizon. The Chalk Marl pit at the bottom of the valley provided only broken fragments mainly of Inoceramus. After noting the striking way in which the contour was affected by the underlying strata the party made its way back by the large Guildford chalk pits to Shalford.

On May 23rd the new clay pit near the railway at Bracknell was visited. Two layers of septarian nodules occur in this each of which provided large numbers of Protocardium, Mytilus elegans, Pleurotoma, Natica, Ditrupa and fragments of wood apparently palm riddled by boring worms.

On May 25th a small party bicycled to the Hog's Back, and visited the chalk pits along the South side, obtaining a few of the more characteristic fossils.

On June 8th the geologists, who were provided with bicycles, joined the rest of the Field Club at Crooksbury Common, the general character of which, although on Lower Greensand, strikingly reminded us of the pines and heather of the Bagshots at Wellington. The only cultivated land we passed appeared to be alluvium of the Wey, some of the lower river terraces of which, are shown in excellent sections in the road cuttings.

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On reaching the plateau gravel at Short Heath, above Farnham, a number of well worked implements were obtained from the workmen, who stated that well polished ones were also found at the same depth as the rougher type.

On July 6th we took bicycles with us to Didcot, starting by the 9.48 train. Leaving the Gault at Didcot, where we found no exposures, we cycled through East Hendred to the Ridgway, which runs along the chalk downs. Here, near Cuckhamsley Barrow, several shallow pits were found, the main mass of chalk yielding Micraster and Spondylus, the lower part showing dark green bands of hard rock. This was proved later to be extremely phosphatic by the chemists of the party. Traces of gasteropods were found in a narrow band above the upper phosphatic bed, but were neither numerous nor well preserved, although Hill, Pierson and Leith Ross were fairly successful. Leaving the Ridgway we rapidly descended to Wantage, and after a short rest began our long ride back through Harwell to Moulsford, noticing on our way the fruit gardens along the Upper Greensand and the mud walls along the Gault.

On July 11th another visit was paid to the new brick pit at Bracknell, which we found considerably developed since May, but were told that an ardent geologist had arrived with a horse and cart and had removed the best nodules. However, in the remainder, Palmer found several Pleurotoma and Dentalium, and Leith Ross parts of an Ophiura and numerous gasteropods.

On July 20th we went by rail to Ash and bicycled to Aldershot brickfield, which shows a good section of London Clay with apparently the same band of black flint pebbles found at a greater depth (43 ft.) at Bracknell. This bed we found again cut through at 48 ft. from the surface by the shafts cut for pipe-laying on the Farnham road. These shafts were inundated with water from the sands overlying the London Clay. Passing through Farnham we rode along the Gault strike down the Wey valley to a good section of a lower river terrace composed mainly of rounded flint and ironstone pebbles. Leaving this we made our second visit to the Short Heath gravel, but obtained no implements. From this we cycled to Puttenham, with a bathe by the way, to join the Field Club at tea.

During the year the geologists of the Field Club have shown much more power of observation than in the year before. This is most evident in some of the really good note books sent in, the best by Leith Ross being full of original drawings and notes; while the essay, by Street, on the Geology of Hampshire in connection with the scenery showed an unusual power of observing facts and reasoning from them.

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During November and December a great amount of interest has been shown in the pits in the shallow gravel capping the "Ridges." In November C. M. Rogers found several roughly chipped flakes which he submitted to Mr. Shrubsole, of Reading, who pronounced them genuine Eolithic scrapers. Since then a number of others have been found by various searchers. By far the greater number are natural stones the edges of which have been used as "hollow scrapers," and so in most cases have been worn down. The only two exceptions are included in those upon which Prof. Rupert Jones has been kind enough to report. As yet all the implements have been found in one spot and therefore at the same level, but it is to be hoped careful search will be made elsewhere in the gravel plateaux and that in all cases if specimens are found the locality will be carefully noted. Caesar's Camp, Wickham Bushes, and the gravel pits beyond Finchampstead may be suggested as likely localities.

The following is the report most kindly made by Professor T. Rupert Jones, F.R.S., upon seven specimens submitted to him, of which illustrations are also given.

All of them are like common gravel stones except 518.

Specimens Marked.

518 *Straight-edged Scraper.* Naturally (?) shaped sub-oblong fragment of cream coloured flint. Possibly it may have been part of an artificially struck flake. Definitely dressed on one edge marked (*a*) in the outline; less strongly chipped at the end (*b*), and imperfectly dressed on the edge marked (*c*).

519 *Hollow Scraper.* A rough naturally shaped water-worn piece of brownish flint, retaining two old whitish weathered surfaces; one of these is a smooth old fracture; the other the irregular old surface of the original flint. One edge hollowed by a broad curved flake (possibly due to frost action). The remaining outer sharp edge was chipped at a certain angle and subsequently worn by use. The surface of the broad hollow is glazed.

520 *Shallow hollow Scraper.* Natural sub-triangular fragment of a piece of flat flint brownish within and anciently weathered white outside; a piece of dull white flint is adherent on one face. The thinnest edge has been chipped away to a shallow concave slightly oblique.

526 *Sharp pointed implement.* Obliquely curved triangular flake-like piece of brownish flint, probably a natural flat fragment. Both edges chipped and used. One rather convex, the other rather concave and thus somewhat resembling a shark's tooth.

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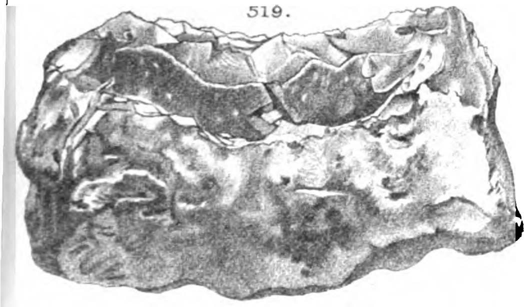
519.



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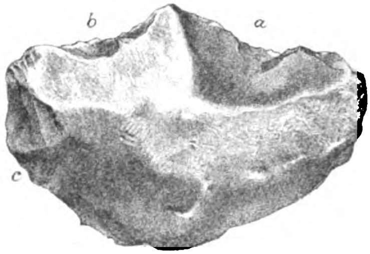

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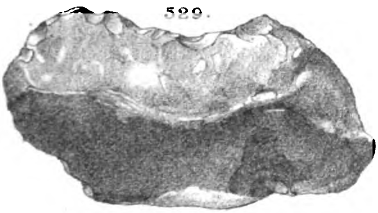

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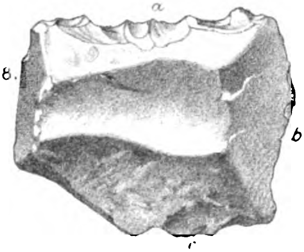

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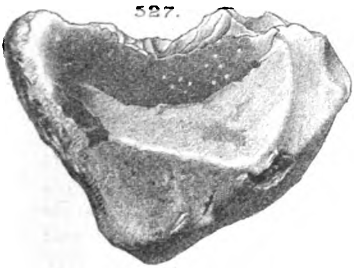

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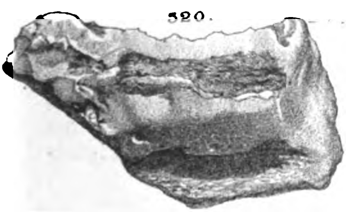

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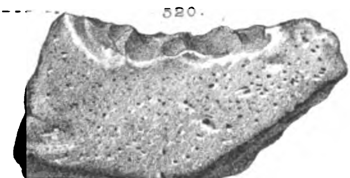

FLINT IMPLEMENTS (EOLITHIC) FOUND ON FINCHAMPSTEAD RIDGES.

NATURAL SIZE.

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527 *Hollow Scraper.* A natural angular fragment of flint, brownish within but whitened on the angular surface by ancient weathering: and in a less degree on the flat face formed by ancient fracture. Hollowed on the sloping face by a broad curved flake (possibly by frost) leaving a thin edge which has been hollowed by chipping.

528 *Double hollow Scraper.* Native irregular fragment of light brown flint, definitely flaked and chipped at the thinnest edge into two semi-circular hollows at (*a*) and (*b*) leaving a projection between them. Some obscure chipping at (*c*) probably made to give more symmetry to the end of the specimen.

529 *Hollow Scraper.* A naturally broken irregular shaped piece of brown flint glazed on all the smooth parts since it was shaped, hollowed by chipping on the edge of one of its sloping sides. The edges of one end of the specimen show some obscure chipping.

All are really "Gravel" stones, that is they are quite like the usual flint constituents of Berkshire gravel, except that they have been bleached clear of the usual ferruginous stains, by rain water probably. No. 518 appears to be an exception on account of its artificial appearance as part of a flake that has been struck off a block by an intelligent blow.

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PHOTOGRAPHIC SECTION.

BALANCE SHEET.

RECEIPTS.

1901.	£	s.	d.
Balance, December 31st, 1900	11	18	11
Lent Term—Entrance Fees		10	0
Subscriptions		9	0
Midsummer Term—Entrance Fees ..		5	0
Subscriptions		8	0
From N.S.S. towards Mr. Hepworth's Fee	2	2	0
Michaelmas Term—Entrance Fees ...		15	0
Subscriptions		7	0
	£16	14	11

EXPENDITURE.

1901.	£	s.	d.
Knight, Hypo.		2	6
Beavis, Repairs of Lamps		10	0
Mr. Hepworth's Demonstration	4	4	0
Adams & Co., Ruby Glass		4	9
Knight, Hypo.		5	0
Cleaning for year...	1	0	0
Porter for year	1	0	0
Balance, December 31st, 1901	9	8	8
	£16	14	11

P. H. KEMPTHORNE, *Director.*

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THIRTY-THIRD ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1902.

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Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
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1903.

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Contents.

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RULES.

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1. That this Society be called the "Wellington College Natural Science Society."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That only Members of the Upper School, with Upper Middle I and the Upper and Middle Seconds, be eligible as Associates, or be admitted to lectures; but that the Committee have power to elect or admit members of the Middle School who have shewn special interest in Science or Art. And that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names, with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule, 5 need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last Meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for four years from

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the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other Benefactors.

18. That Members pay a subscription of 1s. 6d., and Associates of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last Meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all Meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read Papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That Meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, a Field Club Section and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

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TREASURER { J. C. F. ROYLE W. S. E. MONEY

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SECRETARY OF THE PHOTOGRAPHIC SECTION—R. G. DAINTY.

DIRECTOR OF THE FIELD CLUB SECTION—REV. H. P. FITZGERALD.

SECRETARIES—For ORNITHOLOGY AND OOLOGY, A. S. TOMLINSON, Esq.

For ENTOMOLOGY, H. GRIMKE DRAYTON.

For GEOLOGY, W. LEITH ROSS.

GENERAL SECRETARY—J. R. L. HEYLAND.

DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, Esq.

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December 13th, 1902. S. A. SAUNDER.

W. S. E. MONEY, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 8th.

W. H. Wagstaff, Esq. gave a lecture on "The Rainbow."

To see a rainbow the following conditions have to be fulfilled: (1) We must have our backs to the sun. (2) The sun must be shining while the rain is falling. It is thus evident that the bow is caused by the sun's rays being reflected by the drops of falling water, but if we wish to know more exactly how this takes place we have first to study the effect of sunlight on a single drop. As this requires a knowledge of the laws of reflection and refraction, a part of the lecture was devoted to an explanation of these laws, and it was shewn how the eye is frequently deceived through its inability to tell whether a ray of light entering it from an external object has undergone any bending or "deviation" on the way; for instance, if we look at a coin at the bottom of a tank of water, we see the coin because certain rays from the coin, after passing through the water and the air, enter our eye; but the place where we see the coin is not the place where it really is, because the rays are bent at the surface of the water, and the eye being unconscious of this fact imagines that they have travelled in a straight line from start to finish.

The bending or "deviation" of light thus alluded to has a very important bearing on the formation of the rainbow; a ray of light striking a drop of water makes its way inside the drop, is then reflected at the back and finally emerges in a totally different direction, a fact which the lecturer here illustrated by throwing some excellent diagrams on the screen.

He then said that there are three kinds of beams of light: (1) Convergent, (2) Divergent, (3) Parallel, and taking the last named as being that by which a rainbow is produced, he pointed out that its peculiarity lay in the fact that the intensity of its light is the same at all distances, as can easily be seen by the familiar case of a bull's eye lantern. The result of this is, that if the eye is placed in the path of a parallel beam of sunlight it receives a strong light and sees a bright spot in the sky. A simple rule may be given for finding the exact locus of this bright spot: stand with your back to the sun, from which draw an imaginary line through the back of your head and out through

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your eye, look along this straight line and then raise your eye through an angle of 42 degrees, when you will see a bright spot. By varying the direction you can see any number of these bright spots all arranged along part of a circle, and these form the rainbow.

Going on then to speak of the colours he said that although the light is white when it enters the drop, it is split up into Red, Orange, Yellow, Green, Blue, Indigo, Violet when it comes out, and this accounts for the colours in a bow being always the same and in the same order. In the secondary bow, the light of which has undergone a second reflection inside the drop, the colours are reversed. This led to the statement that there are numberless bows in the sky, but, owing to their faintness and proximity to the sun we could not see them, although the fifth could sometimes be seen in a waterfall.

The lecturer concluded with a few words on White Rainbows, Lunar Rainbows and other kindred phenomena.

Mr. Hagreen proposed a vote of thanks, which was most cordially responded to.

Saturday, February 22nd.

G. R. Leighton, Esq., M.D., gave a lecture on "British Serpents."

The three kinds of British snakes were shortly described:

(1) The Smooth Snake (Coronella austriaca) is found in Dorsetshire, Surrey and Hampshire, but it is by no means common. We were reminded that specimens had been found in our district, and were exhorted to keep a sharp look out for others as the area appeared suitable.

(2) The Ring Snake (Tropidonotus natrix) ranges over South and West England, Wales and part of Scotland, is perfectly harmless but frequently suffers by being mistaken by the ignorant for an adder. Its distinct yellow ring near the neck, and the absence of the dark zigzag line along the back enable anyone to distinguish them at a glance.

(3) The Adder (Vipera berus) is more widely distributed than the previous species and even reaches the Western islands of Scotland. The triangular head, the black V-shaped mark on it and the black dorsal zigzag were illustrated by drawings. A long tapering tail distinguishes the male, a short and rather stumpy one the female. The colouration of the sexes is also different, but this characteristic is affected by age and locality.

The life history of a snake was then described. Whether born alive, as in the case of the adder, or hatched out of the egg as in

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the other two cases the young snake is only a few inches in length, and to reach the size of an adult has to grow considerably. The hard horny scales of the skin do not grow, so the process of sloughing or periodical casting of the skin becomes necessary. Some very perfect sloughs showing each scale and even a film from the eye were then shown. The process was shown to consist of two stages, first a physiological one during which a regular growth of short hairs or bristles springs up between the new skin and the outer one, which thus becomes separated, dead, and dry. The second or mechanical stage consists of a further loosening of this dry outer covering by rubbing against stones and other bodies. It then peels off inside out beginning at the head and finally slips off frequently unbroken at the tail. Snakes in this country only lead an active life during the summer months; the latter part of the autumn, the winter and the early spring being spent in hibernating in banks, hedgerows or old leaves. During this period the animal appears to be dead, there is no sign of respiration and mould grows over their bodies. They, however, gradually revive as the weather gets warmer and breed in the early summer. The ring snake lays her eggs in rotten leaves or in a manure heap if she can find one. An instance was mentioned of a spot near a house appearing so suitable that it was selected by numbers of ring snakes, whose offspring as they hatched out invaded the rooms by hundreds. Young adders are born alive and appear to be fierce, harmless and agile. The old and vexed question as to whether they are swallowed in emergencies by their mother was treated with great caution and a verdict of not proven returned.

The method by which an adder strikes was then described. A long hollow fang lies back almost flat in the mouth and is connected by a duct with the gland which secretes and stores the venom. The wide opening of the mouth brings this fang into a forward and horizontal position and thus, if the adder strikes, the gland being compresssed forces the venom through the duct into the wound made by the fang. However, we were assured an adder always prefers retreating to fighting and only strikes if cornered. The result of being "bitten" depends not on the season as some suppose, but on the amount of venom stored up, and this will obviously depend on the time which has elapsed since the last "bite."

The lecturer described his methods of observing and catching adders alive, the latter by an ingenious piece of apparatus.

The lecture was illustrated throughout by an excellent series of photographs of specimens both dead and alive; the latter having been taken under many difficulties.

A vote of thanks to the lecturer was proposed by Mr. Bevir.

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Saturday, March 8th.

J. Sparkes, Esq., gave a lecture on "Norway."

The lecturer gave a most interesting account of the country and its people, drawn mainly from his own experiences of many years. The illustrations, without which any report must be very inadequate, dealt not only with the natural beauties of Norway but with the history, arts, industries and customs of the inhabitants.

With a few exceptions such as the cathedrals of Trondhjem and Stavanger, the Gothic spirit has left little trace on the art of Norway. The structure and decoration of wooden buildings such as are found, for instance, in the Saetersdal, suggest rather the hardy Norsemen who raided our coasts in the tenth century. Everywhere in the country districts, until the advent of the railroad or the steamboat, life is primitive, simple, conservative, quite careless of comforts that to us have become necessities. Each farm is practically self-supporting for clothing as well as food, for the wool is spun, woven, and dyed at home, and with a little embroidery, and the brooches and buttons of traditional patterns made by the local silversmith, forms the characteristic and handsome costume of the valley, or the fjord.

The (Lutheran) pastor and the doctor each have to serve an immense district; so that in some churches there is service only once a month; and people bear uncomplainingly and unattended, pain and disease that would seem to us to demand immediate treatment.

One great industry of Norway is the Cod fishery, of which several illustrations were shown. In the fifteenth century the merchants of the Hanseatic league obtained a monopoly of the trade for their agencies in Bergen. The relics of their power preserved in the Hanseatic museum show the rigour with which they ruled their apprentices, and the shameless way in which they oppressed and cheated the Norwegians.

A collection of Norwegian objects was exhibited, including a number of articles of jewellery, and a bridal crown from the Hardanger fjord.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, March 22nd.

The Rev. P. H. Kempthorne gave a lecture on "Jupiter and Saturn."

The Solar system is one of little importance among the heavenly bodies. The eye would not recognize it except as a

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mere point, when viewed from the nearest fixed star. When we consider the planets, the colossal four, Jupiter, Saturn, Uranus, Neptune must be put in a class by themselves. The distances of these planets from the Earth, insignificant as they are, when compared with the remoteness of stars, are nevertheless almost beyond our power to realize. A cannon ball would take about nine years to reach the sun from the earth and we must multiply this by five to give an idea of the distance of Jupiter. This planet is larger than all the rest of the planets put together, whether we regard his actual bulk or the mass of matter contained in it. A wire stretched round his equator, if extended would reach from the earth to a point beyond the moon. His globe is very much flattened at the poles, far more so than that of the Earth. Jupiter, though he is equal in size to 1300 earths, would only weigh 316 times as much. The force of gravity on his surface is therefore proportionately less: but nevertheless a man would on his surface walk with great difficulty. Jupiter rotates with enormous velocity. A point on his surface would go right round in about 9 hours 55 minutes. Spots, however, in different latitudes do not all go round in the same time. The planet is surrounded by a very deep atmosphere, which prevents our seeing the solid body of the planet. It is not unlikely that Jupiter more resembles the sun than the earth, there may not be any crust at all. It is almost certainly far too hot to be the abode of life. The principal features of Jupiter as seen in the telescope are a series of parallel dark horizontal belts. They vary in appearance, number and colour, and numerous spots appear upon them and vanish after more or less time. The central belts are often connected by dark streaks. The four well known moons of Jupiter and their revolution were detected by Galileo with his newly invented telescope. They have dark markings upon them. In 1892, Prof. Barnard discovered a fifth satellite about 100 miles in diameter. When the satellites are between Jupiter and the sun they throw a shadow on the planet, which has the appearance of a small dark spot. When a satellite passes to the other side of Jupiter, it often enters his shadow and suffers eclipse. The times of these eclipses can be calculated accurately. It was found, however, that when Jupiter was far away from us the eclipses occurred later than the predicted time: and it was then discovered that this was due to the fact that light took appreciable time to travel across space. The actual velocity of Light was thus discovered, since the time of the eclipse and the distance of Jupiter were known.

Saturn is a body which in the general appearance of his globe resembles Jupiter, and must be similar in constitution. It is, however, smaller and is even lighter in proportion to its cubic

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contents. There are eight known satellites which vary greatly in size, and there are probably many others which we cannot see. The System of Rings constitutes a unique feature. They are three in number, concentric, broad and very thin. We may compare them to circular discs of white paper pierced through the centre. They are about 170,000 miles from the inner to the outer edge and not more than 100 miles thick. The outer ring is narrow and dull. It is separated from the middle ring by a chasm 1600 miles wide. The centre of this ring is very bright. The inner ring was only discovered in 1850. It is dark and transparent, and allows the body of the planet to be seen through it. It is pretty certain that the rings are formed of millions of minute bodies which revolve about the planet. This is the only known formation of the kind in the Solar system. But there are many of the nebulæ which assume the ring form, of which the Andromeda nebula is the best known. The rings of Saturn are an instance of the amazing variety to be found in the heavens, which recent discoveries in the stellar universe bring home more and more to our minds.

A vote of thanks to the lecturer was proposed by the President.

Saturday, April 5th.

H. W. O. Hagreen, Esq. gave a lecture on "Life in Ancient Egypt."

The subject might almost as well have been entitled "Life and Death in Ancient Egypt" so much is our knowledge of the old Egyptians dependent on the funeral customs consequent on their belief in a future life.

Recent excavations have revealed relics of marvellous antiquity, but the civilization with which we have been hitherto familiar, and which begins with the pyramid-builders, dates back beyond 4000 B.C. At that time the religion of the people demanded the protection and preservation of the corpse from injury and decay. This was done by embalming or mummifying. The methods varied greatly, according to cost (an interesting account is to be found in Herodotus, Book II); but people who could afford it were usually placed in a light case or cartonnage of many thicknesses of linen, covered with a thin coating of plaster, with a great variety of figures and inscriptions. Then there would be an outer coffin of sycamore wood and perhaps outside that a Sarcophagus of alabaster, porphyry or granite. The great pyramids, in which the early kings were buried, were constructed with the most elaborate precautions to protect the sepulchral chambers from desecration; but these were violated and rifled by the Arab Caliphs. The story of their rediscovery in

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the early part of the last century is extremely interesting. The mummy and part of the coffin and sarcophagus of King Mycerinus (Men-Kau-Ra) builder of the third pyramid (circa B.C. 3630) are in the British Museum.

In the great tomb-cities which grew up at Thebes and elsewhere, the burial chambers contain objects of every kind which could be of use to the *Ka* or "double" of the deceased in the life after death, and the walls are covered with paintings of every class of subject. There is scarcely any pursuit of business or pleasure which is not illustrated; from the campaigns of the kings to the cooking of a dinner, from the worship of the gods to the making of shoes, everything is depicted: and although gangs of grave thieves infested these cities from their beginning, and in many cases the tombs have been used as burial places by the Arabs, enough remains to enable us to reconstruct the life of an ancient Egyptian with astonishing fulness of detail, even without a knowledge of the inscriptions. These however, through a series of discoveries in which the famous Rosetta Stone plays the most conspicuous part, are now quite easily deciphered.

The main characteristics of Egyptian architecture are familiar, and the origin of much of its decoration (for instance the column-forms suggested by the lotus and papyrus plants), have been always obvious; many features have seemed so simple and appropriate as hardly to provoke enquiry as to their source. But it is interesting to find, here as elsewhere, how little is due to deliberate invention, and how much to original necessity. Thus, Professor Petrie has shown that the sloping faces which have such a magnificent effect in the walls of the great temples are due to the device of laying the mud-bricks of their prototypes upon a slightly hollowed foundation so as to render them less likely to slip and slide down in a rain-storm. Or again, the simple "roll" moulding at the angles of those walls represents the long reed, which in a mud faced structure would both protect the corner and afford a neater "finish."

Numerous objects from the College museum were exhibited and explained. These included a portion of the cartonnage of a prince's mummy, crowns from statuettes of gods, Ushabtiu figures, the clay seal of a scribe of the King's granaries, a number of toilet articles such as a bronze mirror, jars for cosmetics, bead necklaces, amulets, &c., &c.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

Saturday, May 24th.

H. Awdry, Esq. gave a lecture on "Pictures in Greece."

The lecturer began by enumerating, in view of the recent

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volcanic disturbances in the West Indies, the number of volcanoes in Europe. He mentioned that there are *two* in the Lipari Isles, one of which is named Vulcano,—the less known now, but the one that Virgil described;—he showed this in eruption in 1889. Etna was the highest in Europe and he shewed two photographs of it, one from Catania and one from Messina: he then turned to Vesuvius, and described the crater which forms Lake Avernus (ἄορνος) close by and threw on to the screen a slide of Monte Nuovo, a hill suddenly formed by an earthquake or eruption in the 13th century.

He then turned to Greece, and described the island of Thera, the rim of a submerged crater, of which he shewed some magnificent photographs. Possibly a passage in Revelation may refer to an eruption of Thera, since Patmos and Thera were only 90 miles apart, at which distance it was quite possible for ashes to fall and volcanic sights and sounds to be distinguished.

He then attacked the real subject of his lecture, the first and the last great struggles of free Greece; first he told the story of Marathon, illustrated by some fine and expressive photographs. The enormous array of the Persian host, the events leading up to the fight, the march of the Athenians to Marathon, their position there, their pluck and numbers, so few and yet so brave, were all touched on. In a few words he told of the fight and its end, and how, although the Persians tried to forestall the Athenians and sail round to Athens, they did not succeed: this decisive victory saved Europe as well as Greece, and kept the West free from the voluptuous luxury and unprogressive despotism of the East till Turkish times 1950 years later. Passing on to Athens herself he shewed some fine slides of Athens, the Acropolis, and the frieze of the Parthenon.

With a view to leading up to the last act in the drama of Greek freedom, the audience were then introduced to Delphi. It is situated in a deep gorge and the views of the crags on each side were very impressive: the only eagles the lecturer had ever seen were there, and there was a wonderful grotto called the Castalian gorge. He showed a photograph of the terrace on which the Temple had been built inscribed with chiselled names, the East end of the temple where the oracles were given, a plan of what it must have been like, and a tripod, with various other objects of interest.

Leaving this he drew a picture of Turkish tyranny in the Middle Ages, how the peasants were taxed from $\frac{1}{20}$ to $\frac{1}{3}$ on all their produce, how there was a poll-tax which produced £3,500,000 to the Turks out of a revenue of £6,000,000: and how their children were taken away and made Turks. No more completely tyrannical or cruel system could be imagined,

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and the effects of the desolation produced are everywhere visible to the present day.

Passing from this digression back to Delphi the lecturer pointed out how rich it had been: it was administered and governed by an Amphictyony of States: at one of the meetings of these Aeschines the Athenian (who was in the pay of Philip of Macedon) pointed out that certain Amphissians had cultivated sacred ground; so war was declared on them: the Amphictyonic league invited the Macedonians under Philip to punish them, and the latter marched into Greece; but instead of attacking Amphissa he seized and fortified the town of Elatea, which showed that his designs were against Thebes and Athens and that the liberty of Greece herself was threatened; upon this a meeting was held at Athens, at which the great Demosthenes said that for the sake of Greece, Athens must offer her alliance unreservedly to her jealous rival Thebes; this done, the Athenians and Thebans together opposed Philip and fought till they were crushed at Chaeronea and with them fell Greek liberty. Demosthenes subsequently had to flee from Athens, and Greece was never free again till the battle of Navarino in 1829, concerning which he quoted some lines from the "Christian Year."

All this had been profusely illustrated with interesting views. Before concluding, the lecturer touched on various forms and examples of Greek building and sepulchral sculptures, *à propos* of which he shewed some fine views of the street of tombs at Athens, and a famous tomb at Mycenae.

A vote of thanks to the lecturer was proposed by the President.

Saturday, June 7th.

J. L. Bevir, Esq. gave a lecture on "The Isle of Unrest."

He shortly described the general character of the island of Corsica and its inhabitants and then showed a series of views of Ajaccio, of the country from the coast to Corte, and of the sea coast from Ajaccio to La Pianes. In explaining them he gave an interesting account of the fishing, the different beasts and birds, and also of the Banditi and of the Vendetta.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

Saturday, July 5th.

J. A. Hardcastle, Esq., F.R.A.S., gave a lecture on "Spectrum Analysis."

One of the fundamental laws of light is that it travels in a straight line so long as its path is in one medium, but when it

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passes from one medium to another, as for instance from air to glass, part of it is reflected and part refracted, that is its path is bent. Some substances colour light as they reflect it, it was shewn for instance that light reflected by a piece of gold leaf was coloured yellow, whilst light which passed through the leaf was green. If a pair of polished silver mirrors are so arranged that light is reflected from one to the other a dozen times it will be found that at last only red light is reflected. Most substances allow light to pass a little way below their surface before they reflect it, and some of the light is usually absorbed in the passage, so that the light which is finally reflected in all directions, or scattered, is coloured, certain colours suffering much less absorption than others. This absorption is the most usual cause of the colour which we see in natural bodies. When light passes from one medium into another its path is bent and the amount of bending depends upon the colour of the light. When it passes through a triangular glass prism the bending is in the same direction, both when it enters and when it leaves the glass, and, if certain details are properly attended to, white light is spread out into a long coloured band or spectrum with the red at one end and the violet at the other. When a piece of coloured glass is interposed in the course of the light we at once see the reason for its colour. A piece of red glass stops all the blue and green light and allows only the red, orange and yellow to pass through. Other substances stop all the red, orange and yellow, but allow the green, blue and violet light to pass through, these appear blue. Sometimes substances which appear of the same colour to the eye stop different parts of the light, and then we can in this way analyse a substance and tell of what it is composed. An illustration was shewn in the different absorptions of an infusion of logwood and of port wine.

It is only when light comes from a glowing solid or liquid source, or a mass of gas of such thickness as to be quite opaque, that we get a continuous band of colour. When it proceeds from a thinner stratum of glowing gas we find that the spectrum consists of one or more bright lines, and these bright lines are so characteristic of different gases that as soon as we know their exact colours we can say at once what is the gas from which they proceed. The yellow line given by sodium was shewn on the screen and also some of the lines given by the glowing vapour of iron.

Light is really caused by a succession of waves in a medium which we call Ether. In a wave there are two distinct motions to be considered. First we have the backwards and forwards motion of the vibrating particles, and secondly the onward progress of the wave itself. The way in which the vibration of

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separate particles may produce a forward motion of a wave was illustrated by means of a slide. In the case of light this wave motion moves forward at a rate of nearly 200,000 miles a second, whilst the particles vibrate some 400 billions of times in a second. It is this rate of vibration which determines the colour of the light and also the amount by which the path is bent on passing through a prism. The rate of vibration just quoted is that of red light, in violet light there are nearly 800 billion vibrations a second.

In 1820 a Bavarian optician named Fraunhofer discovered that the spectrum of sunlight was not strictly speaking continuous but that it was crossed by hundreds of fine dark lines, he spent a good deal of time examining them and made a map which shews the position of 576. A little later Sir David Brewster and a German scientist named Kirchoff shewed that the position of many of the dark lines in the solar spectrum agreed with the position the bright lines in the spectra of sodium and other flames, and Kirchoff, by allowing light forming a continuous spectrum to pass through glowing sodium vapour, succeeded in artificially producing the corresponding black line; a similar experiment was shewn, and the black line appeared on the screen. The reason why sodium or any other vapour should stop exactly those kinds of light which it can emit was explained by the analogy of sound, and it was pointed out that it is essential that the absorbing vapour should be at a lower temperature than the source of light giving the continuous spectrum.

From what had been said about the causes of the colours of natural bodies it appeared that these could only appear coloured when the light falling upon them contained rays with the appropriate rates of vibration. To illustrate this the room was lighted with a sodium flame giving only yellow light, and it was found that a bunch of flowers appeared only black and white; on striking a match the colours at once reappeared.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

Saturday, July 19th.

W. Leith Ross read his Essay on "The Geology of part of the Aberdeenshire Coast," for which the Pender Prize had been awarded to him.

Rocks may be classed into two main divisions, sedimentary or those laid down under water, and igneous or those which have once been in a molten condition and have subsequently crystallised. The Aberdeenshire coast is marked by an almost

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total absence of sedimentary strata. Granite forms the main Rock, only covered in places by Boulder Clay and Blown Sand; and since this granite is found to be covered by Old Red Sandstone it is clearly of pre-Devonian age. Two main tracts of Blown Sand are found; a large one in Cruden Bay, the other extending to the north from near Peterhead. The Raised Beaches point to an upheaval of the land of from 15 to 50 feet.

Passing down the Coast from Kirton Head four miles north of Peterhead the Blown Sand extends as far as Craig Ewen, this sand is derived directly from the Granite by disintegration but contains the remains of broken shells. It is blown up into dunes which are at present covered with "Bents" or sand-grass, and appears not to be increasing. The large expanse of sand uncovered at low tide probably assisted in the formation of these dunes. The well known pink Peterhead Granite, the colour of which is due to the iron in its felspar, makes its first appearance at Craig Ewen, where the felspar is much kaolinised by the action of water. The well-marked jointing here in an East and West direction tends to break up the rock into rectangular blocks.

Further south the granite becomes looser and still further appears only in the form of boulders, rounded and waterworn by the action of the waves. The Red Granite re-appears north of Buchanhaven and stretches from here uninterruptedly to Cruden Bay. The river Ugie reaches the sea a short distance north of Buchanhaven passing over the sand in several different streams: the sand is coarser at its mouth than further up-stream, and appears to contain fragments of flint, the last remnants of the denuded cretaceous rocks which probably once covered this area.

The town of Peterhead stands on a promontory about a mile to the south. It is built of Red granite and the quarrying and polishing of this rock forms the main local industry. The shingle beaches found south of Peterhead contain a number of different rocks in which granite and quartz predominate with the addition of mica-schist and clay-slate. The raised beach at Furrah head consists of pebbles of quartz, granite and schist but contains flint pebbles which seem to be less rounded than the others.

A low stack of granite called the Skerry lies about three-quarters of a mile out to sea. At Buchan Ness, the most easterly point of Scotland the rocks are greatly broken by sets of parallel joints running in several directions, while from this point to Cruden Bay the coast is remarkably indented with many precipitous stacks lying off it. The narrow inlets, the natural arches and caves all point to the method by which such stacks are formed. The process is clearly seen in the well-known

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Bullers of Buchan where a cave has been enlarged until an upward fissure reached the surface, thus forming a blow hole, and this has been enlarged by the continual bombardment of the waves to the present cauldron-like hollow, connected with the sea only by an arch which was once the original mouth of the cave. The caves along the coast are formed by the enlargement of small fissures in the granite itself or, in the softer parts, where a dolerite dyke reaches the sea.

The southern part of the coast in question is covered with a red boulder clay, valuable agriculturally and containing many small boulders. The fact that these are not striated appears to shew that they were not carried under the ice, while as they consist of quartz, schist and quartzites they cannot have been derived from the granite on which they rest. A general examination of the distribution of the contents of this boulder clay points to its derivation from the south.

Cruden Bay, the most southerly part of the coast examined, is a lower indented portion of the coast partially cut out of boulder clay and lined for its entire length with sand dunes which reach their greatest height in the middle of the bay. As the coarse grass is covered by freshly blown sand these dunes are increasing, the conditions being favourable for their formation.

Mr. Bevir congratulated Leith Ross on the excellent Essay he had read, which was in every way worthy of its many predecessors.

Mr. Kempthorne then exhibited a number of slides of S. Helena, giving a short account of the Island, with a few notes on each view.

The President proposed a vote of thanks to Mr. Kempthorne.

Saturday, October 11th.

The President gave a lecture on "Comets."

In the Middle Ages Comets were universally looked upon as portents of wars, famines or the death of kings, and the drawings of some of these objects which have come down to us are of a most grotesque description, To us a large Comet is an object of popular interest on account of its strange and beautiful appearance, whilst to the astronomer it presents many problems which so far he has been unable to solve. When a Comet is first discovered it usually appears a small round nebulous object, as it approaches the sun it usually elongates and sometimes throws out a tail in a direction opposite to that in which the sun is. As the Comet turns round the sun the tail still points away from

the sun and disappears as the Comet recedes. When the head of a large Comet is examined in the telescope it generally appears to throw off luminous envelopes towards the sun which, after rising a short distance, seem to be repelled and the material of which they were formed is driven back into the tail. The tail is sometimes curved as was the principal one in Donati's Comet in 1858, and sometimes straight as in the great Comet of 1843, which was computed to be two hundred millions of miles in length. Some Comets throw off more than one tail, and Chéseaux's Comet, which appeared in 1744, had no less than six. It is never safe to predict what a Comet will do, and though there is a series of changes which is recognised as normal, the departures from the normal series are very numerous. In the case of the more recent Comets many of these changes, which would have altogether escaped visual observation, have been revealed by photography. Thus Swift's Comet was found on April 7th, 1892 to have thrown off a nebulous mass during the preceding twenty-four hours which itself resembled a second Comet. In October, 1893, Brooks' Comet was found to have its tail shattered as if by the action of some resisting medium, which it was suggested might have been a stream of meteorites. Holmes' Comet of 1892 seems to have experienced two extraordinary outbursts of brilliancy and then to have completely disappeared. So remarkable was its behaviour that some have doubted whether it was a true Comet at all.

What the physical structure of a Comet actually is has been a very difficult problem. It cannot be solid for stars can be seen through almost any part of it; it is now generally supposed to be a dense swarm of small solid particles, but whether these particles are of the size of grains of sand or whether they weigh several tons apiece we have no means of deciding. The force by which the sun repels the matter composing their tails is supposed to be electrical, and the greater part of their luminosity is also probably due to electrical action. Professor J. J. Thomson has recently shewn that we may probably find a sufficient cause for the electrification of the sun in its intense heat. One effect of the rapid vibration of the molecules is to cause them to throw off small corpuscules called ions, each carrying a charge of negative electricity and leaving the other part of the molecule with a positive charge. The velocities attained by these ions may reach 40,000 to 60,000 miles a second, and many of the phenomena presented by the tails of Comets may be explained by their action.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

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Saturday, November 22nd.

G. E. Blundell, Esq. gave a lecture on "Tracks and Footprints, and how to read them."

The lecturer began by pointing out that it was only very rarely that no tracks or footprints of any kind were left, and that under favourable circumstances these were so characteristic that anyone with practice could identify the animal which had made them, and often could obtain much information as to its pace, how long ago it left the track, its age, condition and other details.

The materials on which tracks are made were then reviewed. Snow was shown to be easy for a beginner, but the conditions are abnormal. The characteristics of impressions on mud, earth and grass were shown on the screen and the possibility of following a track over stony ground was illustrated from an experience of the lecturer's.

The points which enable one to distinguish the tracks of the more common birds were shown by photographs of impressions left by pheasants, partridges, grouse, black game, coots, grebes and others. It was pointed out that the tree loving kinds only left tracks at their drinking places, while the mud haunting species, as the various kinds of wild ducks, invariably left clear and abundant tracks.

The peculiarities of the footprints of rats, voles, stoats, rabbits and hedgehogs were pointed out on the screen. The otter track with its five distinct claws, the badger print with its deep claw marks and the way to distinguish a dog's from a fox's track were then discussed, and an account of a fox stalking a rabbit on the range, chasing him round in circles and finally trotting off with him in his mouth, as read off from the tracks in the sand, was given. The prints left by deer were then described, the lecturer stating that the German forester had to learn seventy five points peculiar to a stag's track alone. The impressions left by unshod and shod horses and the means by which the track of an individual horse can often be recognised were illustrated by specimens of different kinds of horse shoes.

The question of the pace as inferred from the track was then raised and shown to depend on the following considerations: the greater the speed (i) the deeper the imprints (ii) the greater the weight on the toes (iii) the longer the stride. This was illustrated by photographs of horses trotting, cantering and galloping and of the tracks they made at these paces.

It was then pointed out that after identification the date of a track was usually the most useful thing to know, and that this was the most interesting part of the subject. The material had always to be considered, the same track looking old on sand and

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quite new on clay, especially if sheltered. Worm tracks which are abundant and always made at night; grass which, when crushed, withers; muddy imprints on rocks; puddles which, when muddy, take time to settle, and other points which help one to fix a time to a track were touched on. Pebbles struck by a horse's shoe a day, two days, and three days before were shown; the rusting of the iron streak giving a clear indication of the date.

The lecturer concluded by expressing a hope that some of the audience would take up a subject which so often was useful and was always interesting.

A vote of thanks to the lecturer was proposed by Mr. FitzGerald.

Saturday, December 6th.

The Rev. Arthur Carr gave an account of a visit to Greece, which he had been invited to make by two Old Wellingtonians—M. Demetrius Ghica and Mr. Francis Stronge—the former, whose guest Mr. Carr was during his stay in Athens, is now Roumanian Minister at the Hellenic Court; Mr. Stronge is First Secretary at the English Embassy.

The first place of interest described and illustrated by the admirable slides lent by the Hellenic Society was Olympia. Like other places of religious sanctity and importance Olympia is surrounded by a widely extending boundary, here called the Altis within which were numerous temples of the Gods marking he devotion of every age. Here too could be traced the starting point of the famous races. The valley of the Alpheius is dominated by a hill named Kronion strongly resembling Edgbarrow or Ambarrow in its formation. At Athens Mr. Carr had the advantage of the expert guidance of M. Ghica. The interest and beauty of the ancient monuments and historic views exceeded expectation but are too well known to need description. The most important of recent discoveries was a bronze statue of an athlete, which, when fully restored, will rival the famous Hermes of Olympia. At Athens are also to be seen the gold ornaments and masks found at Mycenæ: some of these were of exquisite workmanship. One gold cup answers almost precisely to the cup of Nestor described Il. xi. 632—635.

Among the places visited in Athens were Marathon, Ægina, Phalerum and Eleusis—each with its special points of interest. Before leaving the 'Violet crowned' city Mr. Carr was fortunate in witnessing from Lycabettus the wonderful purple light over the slopes of Hymettus to which that epithet probably owes its

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origin. Leaving Athens Mr. Carr and his travelling companions made an excursion by steamer to Nauplia and thence to Tiryns Mycenæ and Argos vividly recalling Homeric times. The railway from Nauplia to Corinth passes Nemea with its wide pasture lands, a grand hunting ground for the legendary lion. At old Corinth Mr. Carr discovered on one of the stone fragments the name of Seneca inscribed, a point of special interest from his connexion with Gallio.

The last and perhaps the most delightful excursion was to Delphi,—where the grandeur of the natural scenery and the magnificence and extent of the remains can not be adequately described. The height which gave rise to the epithet '*biceps*' is not the mountain summit but the cliff which towers over the Castalian Spring. On descending mount Parnassus by a newly constructed zig-zag road Mr. Carr and his companions Mr. and Mrs. W. J. Tait met with their only misadventure—One of the horses stumbled and fell, dragging the carriage down a steep declivity. Happily however the occupants escaped with a few cuts and bruises.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Wednesday, February 5th.

At a P.B.M., M. G. Holmes, C. W. Christie, J. M. Burchell, T. P. E. Fenwicke Clennell, J. R. Parsons, C. H. Hone, C. A. Watson Taylor, R. H. H. Moore, R. J. F. Sulivan, R. A. Reid, H. E. W. Berkeley Hill, H. M. Foster, A. R. Gartside, L. R. Fowle, G. Jeffreys, S. W. D. Carter, H. P. R. Foster, H. M. M. Robertson, C. M. Forster, H. V. White, A. V. Olphert, G. E. B. Scanlan, R. P. Tweedy, J. S. Barkworth, N. Kennedy, H. F. Lang, R. S. Leach, H. S. I. Pearson, W. H. C. Mansfield, A. W. Batson, D. A. Bannerman, W. S. Howard, were elected Associates.

R. F. W. P. Higgens and W. S. E. Money were elected to serve on the Committee for the term.

At a Committee Meeting, A. S. Watson Taylor and H. K. Shaw were elected Members.

Saturday, February 8th.

At a P.B.M., R. G. Dainty was elected Secretary of the Photographic Section.

At a Committee Meeting, R. G. Dainty was elected a Member.

Monday, May 19th.

At a P.B.M. the following were elected Associates: L. R. Hill, R. C. Trench, F. W. Metcalfe, H. G. Nicolson, R. R. Forde, C. W. Trevelyan, E. M. Gawne, A. D. de R. Martin, D. Rainsford Hannay, C. T. D. Berrington, E. M. Hope, R. R. de C. Grubb, H. L. Bazalgette, W. A. S. Rough, A. W. M. Jesson, T. Hare, H. Brougham, G. S. Russell Pavier, H. M. Field, G. S. Harris, R. Dunn, C. E. B. L. Curzon, G. H. Rhodes, H. C. Mansergh, L. M. Heath, R. C. Duncan, C. A. Bradford, C. R. Watson, H. K. Griffith, S. R. Wason, J. P. G. Worlledge, H. S. Pinder, W. F. Mott, F. F. Watson Taylor, A. C. Thornton, A. Newton, A. D. Thompson, J. L. Haig, J. O. Oakes, T. MacLeod, H. J. de B. Barnett, I. K. Thomson,

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L. Field, A. S. C. Trench, J. W. Pain, R. M. Derry, W. R. Briggs, H. G. Keswick, C. Hayes, J. F. Franks, H. L. B. Lovatt, T. O. Gibb, G. G. Petherick, R. S. J. Faulknor, H. F. Treeby, J. A. Southey, W. E. Sparling, A. F. Prendergast, G. B. T. Smith, H. D. Furze, N. F. D. Buckeridge, E. V. Pringle, J. Bell Irving, W. M. Fowle.

A vote of thanks was passed to J. C. F. Royle, the late Treasurer, who had left.

W. S. E. Money was elected Treasurer.

J. H. Crofton and W. S. E. Money were elected Judges for the Pender Prize.

At a Committee Meeting the following were elected Members : J. R. L. Heyland, H. R. Moore, G. B. Rowan Hamilton, H. Grimké Drayton, J. C. G. Hunter.

Saturday, May 24th.

At a P.B.M., S. G. C. Murray, J. M. Birch, H. W. T. Palmer T. F. Sandeman, H. F. F. Marsh, H. G. M. Railston, E. N. Jones Vaughan, J. E. Murray, E. H. P. Hanham, G. O. Ramsbottom, R. A. Scott, F. H. Huleatt, C. S. S. Malden, V. L. Eardley Wilmot, J. A. S. Hoyes, G. C. Goulding, A. C. E. S. Bowlby, F. H. Liebenrood, were elected Associates.

Monday, October 6th.

At a P.B.M., a vote of thanks was passed to J. H. Crofton, the late Secretary, who had left.

The following were elected Associates: J. F. C. Sanders, M. B. W. Smith Rewse, E. H. J. Duberly, C. M. Forster, A. V. Olphert, R. S. Wahab, G. V. Wildman Lushington, M. G. P. Willoughby, F. B. Binney, A. L. de Cordes, W. W. Forbes Taylor, J. H. Brougham, R. F. Miller, W. H. C. Mansfield, R. E. Bewicke, W. E. Pain, H. F. W. Warden, D. A. Bannerman, P. T. Farrer, R. S. Irwin.

J. F. C. Sanders was elected Secretary.

W. Leith Ross and J. C. G. Hunter were elected to serve on the Committee for the term.

At a Committee Meeting, C. T. Witt, C. A. Chavasse, C. N. Moore, J. F. C. Sanders, were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus chosen by the winner, subject to the approval of the President.

The winner may, if he chooses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President and obtain his sanction before sending in the essay.

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6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1902 was awarded to W. Leith Ross for an Essay on "The Geology of Part of the Coast of Aberdeenshire." An abstract of the Essay is given on pages 22—24.

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the N.S.S., for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). Each collection must be accompanied by a note-book giving dates and localities for all the specimens and which should also contain notes of any original observations in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

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III. One or more prizes are offered by the N.S.S. to Members of the Field Club for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For all the above prizes the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming these or any other specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1902, the prize in Group I was not awarded.

In Group II the first prize was awarded to S. E. Chavasse, the second to R. R. de C. Grubb.

In Group III the prize was awarded to W. Leith Ross.

Photographic Prizes.

Mr. Kempthorne offers a yearly prize, value £1, to Members of the Photographic Section. The conditions may vary from year to year.

The prize for 1902 was for the best photograph considered as a picture. It was awarded to E. R. Wood for a view in Switzerland (Bromide Enlargement). *Proxime accessit*, G. Petherick. Honourable Mention, R. G. Dainty and E. P. Schweder.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·81	51·2	40·4	87·5	47·1	46·1	92	8	·21	S.W.
2	29·34	51·9	42·5	89·1	45·9	44·1	87	6	trace	S.W.
3	30·09	52·7	38·2	85·9	46·9	46·4	96	10	trace	S.
4	29·94	51·1	45·9	82·7	50·2	50·2	100	10	·15	S.W.
5	30·09	46·9	39·2	87·1	41·4	39·3	83	2	trace	N.W.
6	·44	49·6	36·3	90·5	45·2	43·3	86	10		N.W.
7	·60	45·4	39·7	58·4	43·5	41·4	83	10		W.
8	·52	46·7	40·5	53·9	41·6	39·3	82	10		W.
9	·22	52·5	38·2	86·1	44·7	43·2	88	10	·04	S.W.
10	·09	52·1	43·7	65·6	49·9	48·8	92	10	trace	S.W.
11	·11	49·5	46·6	55·1	48·6	47·8	94	10	·02	S.W.
12	·10	49·3	39·9	61·1	45·2	44·9	98	10		S.W.
13	·23	39·1	33·1	49·9	35·5	33·6	82	10		N.E.
14	·58	34·4	22·5	52·7	27·7	25·9	66	7		N.E.
15	·77	42·1	17·7	76·0	22·7	22·7	100	5		N.E.
16	·65		21·5	55·9	39·1	38·2	93	10		W.
17	·53	43·9	37·9	51·7	39·7	39·3	97	10		S.W.
18	·30	42·4	35·8	76·0	37·1	36·8	97	10		N.
19	·38	45·2	23·5	83·6	28·9	28·0	84	0		S.W.
20	·25	50·1	27·6	81·9	44·7	42·4	83	10		W.
21	·33	50·2	43·4	67·0	45·9	44·6	90	10		N.W.
22	·33	51·4	45·0	68·8	47·4	46·3	92	10		W.
23	30·19	47·5	39·4	58·1	44·3	43·9	97	10		S.W.
24	29·41	45·9	40·4	87·9	43·1	42·7	97	10		S.W.
25	·18	38·1	27·9	86·6	33·7	31·8	80	5	·16	S.W.
26	·78	43·9	29·6	98·5	32·4	31·5	88	0	·01	N.W.
27	·44	47·9	31·3	82·9	43·7	43·1	95	5	·26	S.W.
28	·21	44·1	37·5	88·5	43·1	40·8	82	10	trace	S.W.
29	29·97	36·9	26·8	81·1	31·7	29·8	77	0		N.W.
30	30·39	37·1	26·4	80·4	33·1	31·6	82	3		N.W.
31	30·64	37·1	28·2	79·1	35·9	33·6	80	10		E.
Mean	30·12	45·9	35·1	74·2	40·6	39·4	88	7·8	Total ·85	
Mean for 20 years	29·97	43·2	32·3	64·9	37·6	36·7	90	8·3	1·96	

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FEBRUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	30·53	39·2	30·1	73·3	35·7	32·3	71	0		N.E.
2	30·11	37·6	29·0	56·3	31·3	30·0	81	10	·03	E.
3	29·99	34·5	29·3	49·3	31·5	31·4	98	10	·17	N.E.
4	30·07	35·1	30·5	56·9	33·9	33·6	96	10		N.
5	30·06	34·9	29·3	45·9	32·4	31·3	86	10		S.
6	29·49	36·9	30·4	67·6	33·1	32·6	92	10		N.E.
7	·41	37·1	28·4	74·1	33·7	33·0	92	10	·11	N.E.
8	·31	36·7	28·7	69·3	33·1	33·0	98	10	·01	S.
9	·45	38·4	28·1	87·5	29·9	28·8	82	5		S.W.
10	·50	35·1	22·1	76·0	22·2	21·7	86	8		N.
11	·72	41·9	19·8	91·6	34·4	33·2	87	0		S.W.
12	·87	36·9	17·5	87·1	25·1	24·6	87	0		N.
13	29·86	37·9	14·1	80·4	28·2	28·0	96	0		N.E.
14	30·03	35·1	17·5	71·1	28·1	27·8	94	10	trace	N.E.
15	·21	38·5	24·9	77·4	34·7	33·6	89	8		N.E.
16	30·23	39·7	12·1	90·3	23·7	23·4	91	2		S.E.
17	29·86	41·2	14·9	87·9	28·1	27·2	82	0	·02	N.
18	30·00	35·1	26·6	83·9	33·1	33·0	99	10		N.
19	·00	35·1	28·4	80·9	33·7	33·6	99	10	·01	S.
20	·03	40·2	31·6	79·7	32·9	32·8	99	10		N.E.
21	30·03	44·4	31·5	77·1	39·7	39·1	95	8		S.E.
22	29·90	49·7	35·1	95·7	41·1	40·9	99	10	·18	S.E.
23	·73	49·9	40·4	64·5	45·4	45·4	100	10	·09	S.
24	·61	45·2	42·7	55·9	43·7	43·1	95	10	·12	S.E.
25	·61	47·1	41·4	73·8	43·9	43·9	100	10		S.E.
26	29·54	50·5	36·5	91·1	43·7	40·7	78	10	·31	S.
27	·27	51·2	40·2	99·9	49·2	46·9	84	8	·09	S.
28	29·48	53·7	43·7	98·2	48·7	46·7	85	10		S.W.
Mean	29·82	40·7	28·7	76·5	34·8	34·0	91	7·1	Total 1·14	
Mean for 20 Years	30·00	45·1	32·0	75·3	37·8	36·6	89	7·7	1·80	

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MARCH.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry. Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·59	52·1	37·2	95·5	44·4	43·9	96	10	·15	S.W.
2	29·82	54·2	35·5	100·4	40·6	40·4	98	10	·02	S.E.
3	30·00	51·9	35·7	90·9	45·1	43·1	84	10		S.W.
4	·02	46·0	32·3	89·7	38·4	38·1	97	10		S.W.
5	·06	48·9	32·5	87·1	37·4	36·8	94	10		S.W.
6	30·09	56·4	25·6	88·7	34·9	33·8	89	10		S.
7	29·92	51·1	25·9	86·2	44·1	42·7	88	10		N.
8	·91	51·9	41·2	84·1	47·9	46·2	88	10		S.W.
9	·76	56·6	45·7	110·2	50·1	46·3	74	5	·01	N.W.
10	·93	53·9	45·4	87·1	49·5	47·4	86	10		N.
11	29·99	50·2	41·4	85·1	45·7	45·4	98	10		S.W.
12	30·01	54·1	38·2	97·5	49·7	44·5	66	8		S.
13	30·05	55·9	31·5	104·2	50·4	49·0	90	5		S.
14	29·96	50·1	38·2	100·9	49·1	47·2	86	8	·63	S.
15	29·83	52·1	40·4	107·4	47·9	42·9	67	6	trace	S.W.
16	30·10	55·3	39·8	109·2	48·1	44·2	73	2		N.E.
17	·22	59·0	38·2	92·9	52·1	50·0	86	10		S.W.
18	30·08	54·2	43·0	102·4	47·1	42·9	72	10		S.
19	29·91	56·2	39·8	107·9	51·1	45·5	65	8	·01	S.
20	·39	56·2	38·2	103·9	46·9	46·4	96	10	·19	S.W.
21	·26	51·1	35·5	112·7	44·7	40·7	72	8	·09	S.W.
22	·25	51·2	32·3	98·9	45·1	42·7	82	8	·04	S.W.
23	·39	50·7	29·4	115·2	42·6	39·9	79	2		W.
24	·54	45·1	27·6	94·1	42·2	38·9	76	10	·28	S.E.
25	·57	48·9	37·7	105·2	43·9	38·4	62	10		S.E.
26	·98	55·1	31·9	99·9	45·7	40·4	65	8	·23	N.
27	·78	57·9	37·2	114·7	54·7	50·5	74	5	trace	N.E.
28	·91	56·9	42·5	109·4	48·4	46·1	83	3	·03	W.
29	·74	53·5	37·2	65·2	45·6	45·2	97	10	·27	S.W.
30	·94	50·9	33·5	84·7	41·2	39·7	88	10	·52	N.W.
31	29·88	60·6	37·7	112·9	50·1	47·8	84	10		S.W.
Mean	29·83	53·2	36·4	98·2	46·0	43·4	82	8·3	Total 2·47	
Mean for 20 years	29·89	49·3	33·1	90·3	41·3	39·3	84	7·2	1·69	

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APRIL.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·61	55·9	46·1	108·9	50·4	47·8	82	10		S.
2	·81	50·1	28·4	110·9	47·1	41·2	62	8		N.E.
3	·79	54·1	31·5	117·2	48·1	42·5	64	5	·01	N.E.
4	·92	51·1	32·6	109·1	48·1	43·1	67	10	·07	N.
5	·84	51·9	37·5	99·9	46·9	46·2	94	10	·14	S.W.
6	29·97	48·1	35·3	109·1	40·6	37·1	73	7		N.E.
7	30·29	46·1	26·1	86·9	41·1	36·8	68	9		N.
8	·19	47·1	30·3	85·9	46·4	37·1	46	10		S.E.
9	·12	46·7	30·3	79·2	42·9	39·7	76	10		N.E.
10	30·02	47·9	35·5	83·1	42·2	38·3	73	9		E.
11	29·88	52·7	33·5	109·1	47·1	42·2	67	10	·12	N.E.
12	·72	48·1	38·2	105·7	44·0	42·6	88	10	·02	S.W.
13	·91	57·3	31·0	114·9	47·1	42·0	66	0		N.
14	·94	57·8	28·0	110·1	51·7	47·8	75	8	·19	S.W.
15	·62	55·9	40·2	104·2	47·1	47·1	100	10	·07	S.E.
16	·87	58·0	38·4	108·1	52·2	48·2	74	10		S.E.
17	29·91	61·1	34·3	114·1	54·2	49·2	69	5		S.W.
18	30·01	62·8	33·5	114·7	58·7	51·8	62	8		S.W.
19	29·85	67·1	39·2	120·9	62·1	54·5	60	10		S.
20	29·91	61·8	41·5	116·1	53·9	51·0	81	8	·03	S.W.
21	30·04	60·0	45·3	117·7	55·1	51·8	79	10	·21	S.W.
22	29·54	56·2	49·4	109·1	51·5	51·2	98	10	·12	S.W.
23	29·80	59·0	42·5	118·9	56·1	50·0	65	8	trace	S.
24	30·07	63·1	39·5	105·9	56·4	50·5	66	8		S.W.
25	30·05	65·8	33·8	117·1	60·9	51·0	50	3		S.
26	29·85	57·8	45·0	113·4	49·4	46·2	78	8		S.W.
27	29·88	57·4	40·9	106·9	52·6	48·5	74	7		E.
28	30·08	54·6	37·2	108·1	47·5	41·7	63	0		N.E.
29	·22	53·4	32·9	109·3	45·7	41·2	69	8		N.E.
30	30·02	55·3	35·6	104·2	53·1	48·1	69	10		N.W.
Mean	29·92	55·5	36·4	107·3	50·0	45·5	72	8·0	Total ·98	
Mean for 20 years	29·88	55·9	36·8	100·9	47·9	44·4	78	7·0	1·40	

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MAY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·72	57·6	45·2	115·9	50·7	44·4	61	8	trace	N.W.
2	·76	61·3	41·5	117·9	53·1	50·2	81	9	·01	W.
3	·60	53·6	38·8	113·7	53·1	47·1	63	10	·35	S.W.
4	29·86	53·9	35·3	111·4	46·6	43·7	79	10	·04	N.W.
5	30·03	53·4	30·3	115·5	48·1	44·5	75	8	·02	N.W.
6	·17	50·5	29·3	111·3	39·9	37·9	84	10		N.
7	·17	51·6	33·8	119·1	39·9	37·7	82	7	·17	N.
8	·20	51·4	37·1	118·2	44·2	41·1	77	9	·14	N.
9	·19	51·2	28·4	117·4	43·4	40·1	76	10	·02	N.
10	·13	51·4	27·6	105·7	43·7	39·9	73	8		N.
11	30·00	54·6	35·1	116·3	47·4	41·1	60	5	·04	N.E.
12	29·83	54·2	41·2	103·9	45·5	44·4	92	10	·04	N.E.
13	·93	51·3	28·9	107·5	48·2	42·1	62	6	·05	N.E.
14	·89	52·1	27·6	107·1	49·9	42·9	58	5	·15	S.
15	·78	55·4	35·3	99·9	42·7	42·2	95	10	·02	S.
16	·68	56·2	41·5	107·4	52·2	49·0	79	10	·08	S.E.
17	·51	56·3	45·7	103·3	55·7	50·0	66	8	·36	S.E.
18	·53	56·1	39·2	111·9	44·7	43·1	87	7	·16	N.W.
19	29·81	53·9	37·9	111·1	48·6	44·5	73	10	·06	N.W.
20	30·06	54·1	39·4	117·9	49·7	43·1	59	6		N.E.
21	·29	55·9	39·2	114·2	49·9	43·9	62	8		N.E.
22	·31	56·1	40·4	112·1	54·2	47·8	62	10	·30	N.E.
23	·28	62·1	48·1	112·9	55·4	55·0	97	10		N.
24	·42	70·3	47·5	124·9	59·9	56·2	78	10		N.E.
25	·44	66·9	47·3	126·1	59·1	54·7	74	8		N.W.
26	·35	68·0	37·5	127·3	59·7	51·8	59	2		N.W.
27	30·11	68·8	43·9	127·3	61·4	56·0	70	8		N W.
28	29·77	64·7	44·8	122·1	62·2	56·5	69	5	trace	S.W.
29	·85	63·4	46·3	124·4	57·1	50·2	61	10	·15	S.W.
30	·68	59·9	45·3	120·4	51·2	51·0	99	10	·14	N.
31	29·71	68·2	50·3	121·7	59·2	57·9	92	8	·05	N.E.
Mean	29·97	57·6	39·0	115·0	50·9	46·8	74	8·2	Total 2·35	
Mean for 20 years	29·96	61·7	42·3	109·5	54·0	49·7	74	6·8	1·70	

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JUNE.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	%	0—10	In.	
1	29·72	73·1	57·0	130·8	67·9	62·2	70	5	·07	E.
2	30·09	69·3	47·9	127·0	58·6	55·0	78	5	trace	S.
3	·08	74·7	47·3	131·8	62·9	58·4	75	8	·08	S.E.
4	·08	62·2	51·0	126·7	55·1	55·0	99	10	·04	S.E.
5	30·09	64·8	51·0	123·9	60·2	55·2	71	10	·09	S.
6	29·90	57·0	47·4	113·1	51·2	51·0	99	10	·30	S.
7	·55	57·8	45·2	115·9	55·5	50·3	68	10	·21	S.W.
8	·64	59·0	43·8	123·6	50·9	48·7	85	10	·03	N.W.
9	·76	54·4	42·7	101·2	47·7	43·5	72	10		N.
10	·84	58·0	35·9	120·7	51·7	45·5	62	8		N.
11	·81	57·8	44·5	117·1	52·9	48·5	72	10	·08	S.
12	·58	55·5	46·4	112·9	50·4	50·3	99	10	·46	S.
13	·44	52·1	48·3	105·2	50·7	50·7	100	10	·94	N.W.
14	·74	57·3	46·4	105·4	49·1	49·0	99	10	·15	N.W.
15	·69	57·0	44·7	118·7	49·5	48·2	91	10	·32	W.
16	·73	56·2	48·3	118·1	51·2	50·5	95	10	·18	N.W.
17	29·98	59·8	40·4	119·9	54·4	50·0	72	10	·27	N.E.
18	30·14	65·3	39·6	126·7	54·1	52·2	87	10		S.
19	29·84	70·9	45·2	130·8	65·1	58·1	64	8	·15	S.
20	·61	71·2	51·5	117·5	52·9	51·8	92	10	·01	S.
21	·87	67·2	50·8	133·3	62·1	57·0	72	8	·02	N.W.
22	29·64	67·4	45·2	126·1	56·7	54·2	84	10	·02	S.W.
23	30·21	74·7	52·2	126·9	62·7	59·7	82	10		S.W.
24	·26	79·7	49·3	127·0	74·4	64·7	56	0		S.W.
25	·25	73·9	55·2	124·9	70·5	62·9	62	2		S.E.
26	·16	78·1	53·0	127·0	73·1	62·4	52	10		S.E.
27	·22	81·2	50·2	139·0	76·9	64·9	49	3		S.E.
28	30·16	83·1	50·2	131·5	74·9	64·7	53	0		N.E.
29	29·98	73·4	54·3	125·9	72·2	67·5	75	9	·04	S.E.
30	30·03	78·9	52·0	136·0	70·1	62·7	63	5	·16	S.
Mean	29·90	66·4	47·9	122·8	59·5	55·2	77	8·0	Total 3·62	
Mean for 20 years	30·05	68·3	47·5	116·9	60·2	55·6	75	7·0	*1·77	

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JULY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Solar Max.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°	°/o	0—10	In.	
1	29·94	72·1	54·3	128·8	62·2	60·2	88	10	·15	S.W.
2	30·23	62·1	47·4	125·1	54·9	50·2	71	10		N.E.
3	·30	69·1	41·7	123·9	61·2	55·4	68	10		S.W.
4	·18	77·1	44·5	132·3	68·7	60·2	67	8		S.W.
5	·15	76·4	57·4	134·5	65·4	62·4	83	10		N.E.
6	·22	80·1	58·3	133·0	70·4	64·5	69	0		S.W.
7	·16	79·3	55·0	132·1	72·9	67·3	71	3		N.W.
8	·21	81·9	50·4	133·8	73·1	65·7	62	4		S.W.
9	30·02	72·1	56·5	134·0	66·2	63·4	84	10	·25	S.W.
10	29·72	64·8	51·0	125·7	57·1	56·0	93	8	·03	S.W.
11	30·12	64·6	48·3	126·4	57·9	53·3	73	10		N.
12	·21	70·1	37·5	126·6	61·2	54·8	65	2		N.E.
13	·14	76·9	49·8	132·2	62·6	55·3	62	9		S.W.
14	·10	84·1	48·8	133·3	75·1	62·5	47	0		N.E.
15	·04	82·1	52·6	132·3	73·1	63·7	57	3		S.W.
16	·08	75·2	50·5	133·6	70·4	65·4	74	4		S.W.
17	·08	74·1	51·0	137·0	67·7	59·4	59	3		N.
18	·11	66·6	43·4	129·0	58·4	53·8	73	10		N.E.
19	30·09	64·8	40·4	129·8	59·9	52·3	59	6		N.
20	29·86	57·6	48·7	84·1	52·7	51·2	90	10		N.E.
21	·97	54·9	46·6	82·2	51·4	49·3	86	10		N.E.
22	·99	61·6	47·1	86·3	54·5	53·3	92	10	·04	N.E.
23	·95	68·2	51·2	131·0	60·9	56·3	73	10		N.E.
24	·87	65·6	50·0	125·4	60·7	56·3	74	10		W.
25	·95	68·9	50·8	125·5	61·4	56·2	70	10	·24	S.
26	·61	68·7	52·3	120·2	68·2	62·1	69	5	·03	S.W.
27	29·62	64·0	56·2	119·7	59·3	57·5	89	10	·03	S.W.
28	30·17	67·2	48·6		62·1	56·2	67	10	trace	S.W.
29	·21	69·2	49·8		63·7	57·0	65	4		S.W.
30	·18	79·7	48·1		61·9	57·1	73	8	·02	S.W
31	30·12	64·8	50·5		59·7	54·5	70	8	trace	S.
Mean	30·05	68·2	49·6	124·4	63·1	58·0	72	7·3	Total ·79	
Mean for 20 years	29·99	70·7	51·2	118·4	63·0	58·5	76	6·9	2·16	

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AUGUST.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·19	64·3	40·7	57·7	54·3	80	10		S.W.
2	30·05	67·2	43·0	59·6	55·2	74	7	·16	S.W.
3	29·89	66·2	52·0	62·1	57·1	72	8	·15	W.
4	·89	67·1	51·0	56·2	56·0	99	10	·14	N.W.
5	·95	71·2	53·0	65·2	59·9	72	10	·07	N.W.
6	·85	65·0	56·4	62·9	62·3	96	10	·18	S.
7	·78	68·7	54·5	62·7	61·6	94	6	·02	S.W.
8	29·82	69·7	55·3	64·9	60·1	73	8	·12	W.
9	30·15	61·0	44·4	54·9	52·5	84	10		N.W.
10	·06	64·8	50·0	59·4	55·0	74	9	·06	N.W.
11	·07	61·8	42·7	54·9	50·2	71	7	·08	S.W.
12	·03	62·0	48·3	54·2	54·0	99	10		N.W.
13	30·02	64·0	44·2	59·1	56·8	86	10	trace	W.
14	29·94	69·9	55·4	63·7	59·2	75	10	·02	N.W.
15	30·02	70·1	55·2	60·7	59·7	93	10		S.E.
16	29·88	77·7	46·9	63·4	60·3	82	8	·45	N.
17	·73	67·4	57·4	60·5	60·1	97	10	·07	S.W.
18	·81	63·0	57·6	62·2	60·2	88	10	1·08	S.
19	·73	70·9	57·4	63·1	60·7	85	7	·12	S.
20	29·88	71·1	45·5	55·9	55·2	95	10	·07	S.W.
21	30·08	67·4	45·3	58·4	55·0	80	8		N.W.
22	·22	72·7	45·1	62·5	57·9	74	4	·02	S.
23	30·03	65·0	54·7	60·1	59·6	97	10	·22	S.
24	29·86	68·9	58·1	59·4	58·9	97	10	·04	N.W.
25	30·00	68·5	46·4	60·2	56·8	80	2		W.
26	30·04	68·2	45·1	65·6	59·3	67	3		S.E.
27	29·89	68·9	48·6	60·9	58·1	83	6	·05	S.W.
28	·95	75·1	45·1	60·4	58·9	91	10		S.W.
29	·84	79·3	53·2	70·7	63·9	65	4		S.W.
30	·70	62·0	55·5	58·5	56·8	89	10	·16	N.
31	29·82	64·8	52·3	55·1	55·0	99	10	·11	S.
Mean	29·94	67·9	50·3	60·5	57·8	84	8·3	Total 3·39	
Mean for 20 years	29·95	70·1	50·8	62·1	58·2	77	6·9	2·17	

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SEPTEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	29·90	72·4	54·2	64·5	63·9	96	10		S.
2	·87	67·4	53·0	63·2	61·4	89	10	·17	S.
3	·67	69·2	53·0	64·4	60·2	76	8		N.W.
4	29·94	69·2	56·5	64·1	59·1	72	10	·13	N.W.
5	30·05	67·2	50·8	61·5	57·9	79	8		N.W.
6	·11	68·2	49·2	62·1	56·6	70	0		N.W.
7	·17	70·1	44·4	55·9	55·2	95	4		N.W.
8	·25	70·2	42·8	65·7	58·1	61	0		N.E.
9	30·08	69·7	51·8	61·9	60·4	90	10	·02	N.E.
10	29·99	65·4	55·3	65·4	59·2	67	10	·20	N.E.
11	·90	62·4	56·5	61·2	60·1	93	10	·26	S.W.
12	29·71	57·8	48·3	49·9	49·5	97	10		N.E.
13	30·02	64·8	38·2	47·8	43·4	71	8		N.W.
14	29·86	63·0	41·3	54·7	52·1	82	8		N.E.
15	·99	60·8	51·8	57·2	53·8	80	9	·03	N.
16	·77	65·1	53·2	59·7	55·0	73	8		S.W.
17	29.91	59·7	48·5	54·8	49·9	70	5		W.
18	30·22	58·6	35·4	54·3	50·3	75	6		N.W.
19	·37	63·1	32·5	56·8	51·0	66	0		S.E.
20	·31	63·8	41·9	61·2	57·9	80	0		S.E.
21	·22	71·1	49·0	58·1	55·0	82	8		N.E.
22	30·11	72·2	53·6	69·9	64·2	71	5	·	N.E.
23	29·87	67·6	56·0	66·2	61·9	76	10		S.E.
24	30·09	65·2	45·0	58·9	54·2	72	0		S.E.
25	·35	64·3	36·5	59·7	54·5	70	0		S.E.
26	·44	65·7	35·6	58·1	54·7	80	0		N.E.
27	·42	66·9	36·3	60·7	55·2	69	2		N.E.
28	·41	58·1	48·7	53·7	52·0	89	10		N.E.
29	30·24	54·2	42·0	51·6	49·0	82	9		N.E.
30	29·98	55·7	42·2	55·7	50·2	68	10	·02	N.E.
Mean	30·07	65·0	46·4	59·3	55·5	78	6·3	Total ·83	
Mean for 20 years	30·02	65·6	47·6	58·2	55·2	82	7·0	1·87	

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OCTOBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·85	58·0	46·6	54·2	50·8	78	8		N.E.
2	29·95	54·3	48·4	52·2	49·5	82	10		N.E.
3	30·10	46·2	38·2	44·1	42·1	84	10		E.
4	30·08	48·1	40·4	45·4	43·1	83	10	·02	S.E.
5	29·94	51·6	43·6	47·2	45·4	87	10		N.E.
6	·82	52·7	43·6	47·1	46·7	97	10		N.W.
7	·82	54·4	43·4	51·9	49·8	86	10		N.E.
8	·90	58·0	37·7	51·4	49·5	87	10	trace	S.E.
9	·79	60·0	46·1	52·2	51·0	92	10	·36	E.
10	·50	64·0	50·0	59·7	57·1	84	10	·26	S.
11	29·57	56·3	50·2	56·2	56·2	100	10	·01	N.E.
12	30·17	59·3	41·5	48·9	47·2	88	5		N.
13	30·22	59·1	46·1	58·9	56·8	87	10	·05	S.W.
14	29·92	59·8	52·0	56·9	54·2	83	0	·01	S.W.
15	·68	57·0	48·9	56·9	54·3	83	10	·25	S.W.
16	·54	55·1	47·1	53·7	50·2	78	10		S.W.
17	·76	52·9	40·2	50·1	45·7	71	8	·25	N.E.
18	·61	50·1	42·0	48·1	48·1	100	10		N.E.
19	·99	54·2	30·3	35·7	35·6	99	10	·09	N.E.
20	29·73	59·1	35·1	53·4	53·2	99	10	·06	S.W.
21	30·03	57·1	39·4	53·9	50·0	75	10	·05	S.W.
22	·03		40·4	53·1	50·0	80	9		N.
23	·44	57·3	35·3	50·2	49·0	78	10	trace	S.W.
24	·54	56·8	41·0	55·1	50·0	69	8		S.W.
25	·46	60·0	48·1	56·9	54·5	84	10	·01	N.
26	·13	56·6	42·5	48·4	48·3	99	10	trace	S.W.
27	·04	54·7	44·4	49·6	47·5	86	5		N.
28	·10	54·9	36·3	51·7	50·3	90	10		N.E.
29	·10	57·6	48·7	54·7	51·2	78	4	·03	N.E.
30	·06	55·6	44·2	51·7	51·7	100	10		N.E.
31	30·18	52·9	30·8	35·8	33·4	79	5		S.W.
Mean	29·97	55·9	42·6	51·1	49·1	86	8·8	Total 1·45	
Mean for 30 years	29·91	56·3	40·9	49·3	47·4	88	7·2	2·90	

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NOVEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·11	56·4	33·5	52·7	51·3	90	10		N.E.
2	·24	54·3	42·3	46·2	45·1	92	9		N.E.
3	·09	53·1	41·5	47·7	47·7	100	10	trace	N.
4	30·04	53·2	32·5	48·5	47·2	91	10	·02	N.
5	29·65	55·2	39·7	47·7	46·1	88	10	·27	N.E.
6	·60	57·4	47·3	52·9	52·8	99	10	·30	S.
7	·56	57·3	48·1	54·1	50·2	75	4	·11	S.W.
8	·47	54·1	43·2	50·4	50·2	99	10	·21	S.
9	·53	54·4	44·8	48·7	46·4	91	2	·02	W.
10	·86	52·2	42·5	47·1	45·7	89	10	trace	S.W.
11	·65	54·1	42·2	48·4	46·9	89	10	·15	S.W.
12	29·92	57·3	47·6	50·4	49·6	94	6	trace	S.W.
13	30·14	55·9	36·5	50·4	48·3	86	6		S.W.
14	·31	55·1	40·4	52·1	50·5	89	4		S.W.
15	·33	45·9	39·7	43·5	42·7	94	10		S.W.
16	·22	42·7	39·4	41·1	39·3	86	10		S.E.
17	·25	43·9	23·0	34·6	34·5	99	10		E.
18	·25	39·1	26·7	34·9	33·6	89	10		E.
19	·02	35·7	30·9	32·3	31·0	83	10		N.E.
20	·13	35·5	30·3	32·9	32·6	96	10		N.E.
21	·19	37·2	26·4	34·1	32·8	86	10		N.E.
22	30·06	44·6	32·9	35·4	34·0	87	10	·20	N.E.
23	29·92	52·4	34·8	41·2	41·2	100	0	trace	S.W.
24	·68	51·2	36·5	46·7	46·7	100	10	·45	S.W.
25	·21	49·3	46·3	49·1	49·1	100	10	·14	S.W.
26	·37	49·2	45·9	47·2	47·2	100	10	·04	E.
27	·62	49·1	44·2	45·7	44·9	94	10	·30	N.E.
28	·20	52·9	41·4	47·9	47·6	98	10	·10	S.
29	·33	49·6	36·8	47·5	46·9	95	10	·47	S.
30	29·43	46·6	43·0	46·1	46·1	100	10	·13	S.E.
Mean	29·85	49·8	38·7	45·2	44·3	93	8·7	Total 2·91	
Mean for 20 years	29·95	49·6	37·4	43·6	42·6	92	8·0	2·60	

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DECEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In	°	°	°	°	°/o	0—10	In.	
1	29·61	49·4	42·4	43·5	43·5	100	10	·31	S.
2	·55	48·9	43·0	45·7	43·9	87	2	trace	S.W.
3	29·91	38·1	30·5	36·4	36·3	99	10	·04	S.W.
4	30·43	34·1	24·5	32·2	31·0	84	0		N.E.
5	·40	31·4	20·0	29·7	29·3	93	10		N.E.
6	·27	31·9	27·4	31·1	31·0	98	10		N.E.
7	·27	33·9	17·5	26·4	26·4	100	10		N.
8	30·11	35·9	25·6	33·5	31·8	82	10	trace	N.E.
9	29·99	37·3	30·6	34·4	33·0	85	10		E.
10	30·05	37·1	33·3	36·1	34·6	87	10		N.E.
11	·14	33·9	31·8	33·1	32·0	87	10		N.E.
12	·02	46·4	26·7	31·1	30·6	92	10	·13	S.E.
13	·03	51·1	30·3	46·1	46·1	100	10	·03	S.E.
14	30·21	52·1	44·7	50·9	50·0	94	10	·11	S.W.
15	29·94	50·7	42·2	45·2	42·5	80	8	·09	S.W.
16	·93	54·9	36·5	50·1	50·1	100	10	·05	S.W.
17	·97	56·1	49·3	54·7	54·2	97	10	·37	S.W.
18	29·98	49·1	45·1	47·2	43·2	73	6	·01	N.E.
19	30·32	48·9	42·5	46·2	43·5	80	8	trace	N.W.
20	·23	52·1	43·7	48·4	47·2	91	8		N.E.
21	·36	50·1	43·2	49·7	48·3	90	10		N.E.
22	·51	48·4	46·1	47·7	47·2	96	10		N.E.
23	·54	43·2	40·4	41·9	40·9	92	10		S.W.
24	·47	46·9	32·3	37·1	36·5	94	10		S.
25	·27	50·2	30·5	46·7	45·5	91	10		S.W.
26	·18	50·2	44·2	46·4	44·4	85	10		S.W.
27	30·20	51·7	45·3	49·1	46·1	79	6	·05	S.W.
28	29·71	47·1	43·4	44·9	42·2	80	8	·06	S.W.
29	29·10	46·9	32·6	38·2	36·4	85	3		N.E.
30	28·97	40·9	33·4	37·9	35·3	78	0	·11	S.W.
31	29·21	41·4	32·5	38·1	37·6	95	10		N.W.
Mean	30·03	44·8	35·9	41·3	40·0	89	8·4	Total 1·36	
Mean for 20 years	29·92	44·2	32·9	38·5	37·6	91	8·0	2·35	

Total rainfall for the year, 22·14 in.

Mean for 20 years, 24·41 in.

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FIELD CLUB SECTION.

Once more the Field Club has had a very successful season; notice was given that note books would be insisted upon, and this, during the summer term, led to a decrease in the numbers that went for the excursions, wherein lies the success of the scheme, as it kept away a few who were not really keen, and only intended the excursions to be a sort of picnic.

Some of the note books were admirably kept; as for the rest, it is to be hoped that they will improve next year, and not consist merely of the records of a few captures and filled up just for the sake of showing that a note book was kept, so as to fulfil the conditions laid down.

Three big excursions were arranged and carried out, details of which are given below: a few other smaller ones, in which only a few boys joined, also took place.

On April 5th a meeting was held when the following Committee was elected to make the necessary arrangements for the season.

Director	Rev. H. P. FitzGerald
Ornithology	A. S. Tomlinson, Esq.
Entomology	H. Grimké Drayton
Geology	W. Leith Ross
General Secretary	J. R. L. Heyland

EXCURSIONS.

Saturday, May 31st.

An ornithological excursion had been arranged for May 24th to Odiham, but owing to bad weather this had to be postponed. On May 31st, the weather up to 9.30 a.m. looked decidedly unpromising, but at 10.30 a.m. a good change came, and we settled to go as agreed beforehand to the Hog's Back. Leaving by the 12.20 train, 30 in number, we detrained at Wanborough, and lunched in the beech wood on the top of the hill, and afterwards the party dispersed in all directions, many going to the

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Wancote chalk pit for geological purposes, and some visiting the caves in the copse below. The party reassembled at Puttenham for tea at 5 p.m., and we caught the 6.20 train home. There is nothing very remarkable to record; every one seemed pleased on the whole with the day's captures.

SATURDAY, JUNE 21ST.

We started by the 11.57 train to Reading and went on to Goring; the geologists bicycled from Reading, *viâ* Caversham and Mapledurham. Lunch took place in the Church House, by kind permission of the Vicar, Rev. L. J. Wallace, and the party then dispersed, the main body going to explore Streatley Hill. Owing to previous bad weather and the late season, not very much was done. The ornithologists discovered a deserted Shrike's nest, with a larder full of food, containing four whole eggs and two broken ones; the entomologists were disappointed in not finding more of the Blues for which Streatley Hill is noted. Amongst the captures were: Green Hairstreak, Orange Tip, Fox moth, Bee hawks, Pearl bordered Fritillary, etc. At 5 p.m. the party met in Capt. Towse's (O.W.) garden, where an ample tea was most hospitably provided. We caught the 5.58 train back, arriving at the College station at 7 p.m. The weather was threatening at first, but the day turned out beautifully fine and warm; the party numbered 35.

SATURDAY, JULY 12TH.

A party of twenty nine left at midday for Hook Common; the geologists bicycling and the rest driving. The entomologists were delighted to find a large number of White Admirals flying about the woods, and amongst other captures we noticed Pearl bordered Fritillaries. Wood Ringlets, Clouded Buffs, and some small Chocolate tipped Larvæ. One of the party happened accidentally to step on and kill a good sized Adder which was basking in the sun. We all met at 5.15 p.m. at Greywell Hill, where a sumptuous tea was provided by Lady Dorchester, whose hospitality was unbounded. The weather was perfect, and the excursion was considered to have been a great success.

H. PUREFOY FITZGERALD.

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GEOLOGICAL REPORT.

The Geological Excursions have in the past year consisted as usual of several small bicycle expeditions to the nearer points of interest while the more distant ones have been undertaken in conjunction with the rest of the Field Club, or in one case with the Geologists' Association.

The brickfields of the immediate neighbourhood have been examined by numbers of searchers, but even in the most hopeful looking case (on the new Wokingham road) no fossils beyond pieces of lignite have been found.

The Bracknell pit has been several times examined and continues to yield a large number of specimens, but the number of species is not large, and has not been increased. The amount of wood found, apparently palm, is now greater than in former years. Two expeditions were made to the Hog's Back, but as the pits which are most worked appear to be the least fossiliferous, only a moderate number of Micraster and Terebratula were found.

A visit to the gravels at Short Heath above Farnham resulted in our obtaining from the workmen two roughly worked palaeolithic flints, one marked with distinct striations rather difficult to account for, and one polished neolithic axe (broken).

On July 12th the geologists joined the rest of the Field Club in an excursion to Hook Common. The early afternoon was spent in the large Odiham chalk pit, in which neither weathering nor the efforts of the single aged quarryman had succeeded in exposing many fossils since last year's thorough search. From this we bicycled to Greywell after which we examined the lower valley gravels which consisted of a few Lower Greensand pebbles with stained and unstained flint. A distinct iron pan was in process of formation. We then moved to the London Clay pit at the side of the L. and S.W. railway, where most of us loaded ourselves with large specimens of Cyprina planata. A Fenestella was also found.

On May 31st the Geologists' Association, who were visiting Reading, most kindly asked us to join them. Under Mr. Shrubsole's direction we were first shown two river gravels the lower one consisting largely of unworn, unstained chalk

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flints, this was said to contain no implements; the upper one a stained flint gravel with rough palaeoliths and Bos longifrons. Moving on to Tilehurst we were shown the upper gravels with quartzite and igneous pebbles. Returning to Reading we found blocks of the recently re-discovered leaf-bed already cut out for us but it was by no means an easy matter, as many of us found, to get the fine impressions in so soft a material safely home. The clearly marked shell bed of the same series only received a hasty examination, but several specimens were obtained from it.

On June 21st, taking our bicycles by train to Reading, we re-examined the Reading shell beds and obtained some large Ostrea, Pecten and some well preserved shark's teeth. We then rode along the left bank of the Thames with a stop at one or two chalk pits by the way to Goring. The contrast between the steepness of the gorge the river has cut out and flatness of the plateau above was most marked.

Generally speaking it is satisfactory to be able to record the fact that the "mere collector" is very much less to the fore on geological excursions than formerly; on the other hand observations especially of details, inferences therefrom and notes of both have considerably increased.

G. E. BLUNDELL.

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THIRTY-FOURTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1903.

VIRTUTIS FORTUNA COMES

HEROUM FILII

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."

Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1904.

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THE WELLINGTON COLLEGE PRESS:

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Contents.

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RULES.

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1. That this Society be called the "WELLINGTON COLLEGE NATURAL SCIENCE SOCIETY."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That only Members of the Upper School, with Upper Middle I and the Upper and Middle Seconds, be eligible as Associates, or be admitted to lectures; but that the Committee have power to elect or admit members of the Middle School who have shewn special interest in Science or Art. And that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names, with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription ; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other Benefactors.

18. That Members pay a subscription of 1s. 6d., and Associates of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last Meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all Meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read Papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That Meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, a Field Club Section and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

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DIRECTOR OF THE PHOTOGRAPHIC SECTION—REV. P. H. KEMPTHORNE

SECRETARY OF THE PHOTOGRAPHIC SECTION { R. G. DAINTY, V. E. INGLEFIELD

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FOR GEOLOGY, W. A. S. ROUGH

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A. C. P. BUTLER
LL. JONES BATEMAN
R. C. MONEY
W. ASTELL
E. H. S. STANHOPE
F. V. OWEN
G. D. G. ELTON
p J. B. BOLITHO

† Left Easter Term, 1908. ‡ Left Christmas Term, 1908.

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List of the Societies and Journals to whom Copies of the Report are sent.

—:o:—

Winchester College N.H.S.

*Cheltenham College N.H.S.

*Marlborough College N.H.S.

Clifton College N.H.S.

*Rugby School N.H.S.

*Dulwich College N.H.S.

*Haileybury College N.H.S.

*Uppingham School N.S.S.

King Edward's School, Birmingham, N.H.S.

*Felsted School N.H.S.

*Epsom College N.H.S.

Malvern College N.H.S.

*East Kent N.H.S.

British Museum (Natural History).

Geological Survey Office.

*U.S. Geological Survey Office.

Linnean Society.

*Royal Meteorological Society.

*Chicago Academy of Sciences.

*Wisconin Academy of Sciences, Arts and Letters.

*El Instituo Geologico de Mexico.

*University of Montana.

Nature.

Science Gossip.

* Those marked with an asterisk exchange Reports with us.

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ACCOUNTS.

RECEIPTS.

	£	s.	d.
Balance in hand	109	5	5
Subscriptions:			
Lent Term—Honorary Members ...	2	11	0
Members and Associates	3	9	0
Easter Term—Honorary Members...		6	0
Members and Associates	6	10	6
Michaelmas Term—Honorary Members		4	6
Members and Associates	3	13	0
Bursar, for use of Lantern, Gas, &c. ...		15	0
Sale of Report	5	11	8
Interest on Deposit	1	19	9
	£134	5	10

EXPENDITURE.

	£	s.	d.
New Projection Lens for Lantern ...	3	10	0
Gas and Limes for Lectures	1	16	2
Stamps	1	0	0
Carriage of Parcels		14	0
Hire and Purchase of Slides	3	13	8
Hook, for reading Thermometers ...	2	0	0
Watts, for preparing Lecture room ..		5	0
Expenses of Conversazione	4	12	6
Prizes	1	10	0
Spirit, Naphthaline, &c., for Museum...		6	10
New Rain Gauge Measure and Charts		11	9
Hunt, for Printing Report	10	15	0
Account Book			10
Balance in hand...	103	10	1
	£134	5	10

Examined and found correct,
December 18th, 1903. S. A. SAUNDER.

H. KNOX SHAW, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 7th.

H. Hart, Esq. gave a "Talk on India."

The Lecturer gave an account of some of his experiences during a recent tour in the northern part of India. He had landed at Bombay and after procuring a native servant, a most indispensable part of an outfit, he went north, his first stop being at a place near Ahmedabad, the old capital of Gujerat and about 300 miles from Bombay. He then went on to Dilwara and Amber, the old palace of the Maharajah of Jaipur who had lately been entertaining the Duke and Duchess of Connaught. This part of the lecture was illustrated with some very beautiful photographs of the palace and gate of the town at Amber, and of Jain temples at Dilwara in which the lecturer pointed out the difference between Mussulman and Hindu architecture. The Jain religion was probably started about the same time as Buddhism, some 600 years B.C.: its chief doctrine is that everything from a man to a stone, has a soul. The Jains are consequently vegetarians; they will never kill any animal, and they even go so far as to place something over their mouths lest they should swallow a fly or a mosquito and kill it. Enormous sums of money are spent on their temples, one of which photographs were shewn, had cost about £2,000,000. From here the lecturer and his party proceeded by way of Jaipur, the "Pink City," to Simla in the Punjab. The scenery here is very beautiful and here too is the summer residence of the Viceroy, of which a view was shewn, followed by one of Peshawar some 400 miles as the crow flies to the north west. This was the end of the railway, and the journey to the Khyber Pass had to be made in a conveyance known as a "tum-tum." On Tuesdays and Fridays the road is guarded by men of the Khyber Rifles, who are placed at short intervals along the whole length of the Pass, and large caravans cross from the Punjab into Afghanistan; on other days travelling is not safe. Hence the lecturer turned southwards by way of Rawal Pindee, Murri and Lahore. Near Lahore is the tomb of Jehangir, one of the Great Moguls, a large square building of white marble.

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The Moguls were immensely powerful and at one time ruled over Hindustan, their reign lasted from 1556 to 1707, and amongst the best known were Akbar, Jehangir, Shah Jehan and Aurangzib. Their chief residence was at Delhi and there, during the Mutiny, the old king was shut up in his palace and finally taken prisoner. This was the next city visited by the lecturer, and on its walls, which had been strengthened by the English just before the outbreak of the Mutiny, were still to be seen the marks of shot and shell fired from British guns. Outside the city to the north-west of the Kashmir Gate, which faces due north, lies the historic Ridge which was seized by General Barnard on June 8th, 1857, and to the left of the gate is the breach in the walls through which the gallant Nicholson led his men in the following September. Near by is a lane in which the party were met by a storm of bullets and a tablet in the wall marks the place where the bravest of the brave fell mortally wounded whilst endeavouring to urge on his men. He was borne out of the city through the Kashmir Gate, and here it was that Lord Roberts saw him. From Delhi the lecturer proceeded to Agra on the Jumna: just outside the town is the Taj Mahal, erected by Shah Jehan and said to be the most beautiful building in the world. A most interesting and instructive lecture was brought to a close with a photograph of the lecturer's faithful native servant and attendant "John." John knew but little English, on one occasion when asked which was the nearer of two roads, his reply was "Nearer is both," which, if not grammatically correct, was at all events a very intelligible answer.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

Saturday, February 21st.

A. K. Morgan, Esq., A.R.E., gave a demonstration on "Copper Plate Etching."

The true meaning of the word Etching is not, as is so frequently supposed, a pen-and-ink drawing, but it denotes a particular kind of drawing on copper plate which must not be confused with engraving. There are five different kinds known respectively as "Line," "Soft-ground," "Dry-point," "Aqua-tint" and "Mezzo-tint" Etching. In Line Etching, on which the lecturer principally dwelt, the copper is covered with a ground laid on as follows: the copper is warmed, and, to remove all traces of grease on the plate—a very important step in the process—a little turpentine is rubbed on; when this is done a substance of which the principal

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ingredients are bees-wax and black pitch is carefully rubbed on to the plate with a piece of canvas; it is essential that this ground should be thin and even, and to ensure this an instrument called a "dabber" is used; it must however be used as a dabber and must not be dragged over the plate. When this is done the ground is practically finished, but it consists of a light brown transparent coating on which it would be difficult to see the lines drawn, and so the surface is blackened with a torch or taper; care must be taken not to burn the ground, as if this is done the acid will attack parts of the plate which perhaps should be left untouched. The front of the plate is now protected, but the sides and back have still to be coated with Brunswick black, after which the plate is ready for the drawing. If it is intended to draw a difficult and elaborate picture, it is best to make a copy on tracing paper, lay this on the copper and scratch the lines through paper and ground, but this takes time and the simple sketch etched during the demonstration was drawn directly on the ground. When the drawing is completed, the whole plate is immersed in an acid bath containing preferably a dilute solution of nitric acid. After a few minutes bubbles appear along the various lines of the picture shewing that the acid has commenced to attack the copper; these are removed with a feather and another set allowed to appear: when three lots of bubbles have formed, the plate is removed from the acid, washed, and thoroughly dried between blotting paper. All the light lines in the picture are then protected from further action by a coat of Brunswick black, the plate is again placed in the bath and the process repeated. After the second immersion the lines which are desired to appear of medium strength are painted over and the plate is once more returned to the acid in order that the blackest lines may be further bitten in. When this part of the process is completed the soft-ground and Brunswick black are removed by rubbing warm turpentine over them, and a trial print is taken. If it is found that some lines ought to be darker, a little whitening should be rubbed into them and a coating of "re-biting" ground laid over the whole plate with a roller; this will adhere to every portion of the plate except those on which the whitening has been placed; on placing in the acid bath the whitening comes off and the unprotected lines are bitten again.

Dry-point etching is by far the hardest process to work, although the simplest as regards outfit, only a copper plate and an engraving tool being necessary, but the copper is so hard that much strength and skill are required to guide the tool along the desired path.

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In Aqua-tint etching the ground is such as only partially to resist the acid, and may be compared to a covering of dust which would allow the acid to penetrate between the separate particles. Some etchings are made on zinc, for which a much weaker acid is required. If a wrong line has been drawn it can, if shallow, be taken out with a burnisher which turns in the edges and fills up the mark bitten by the acid; if it is too deep to be got rid of in this way it is cut out with a scraper, the plate is then turned over and punched immediately behind the scraped part, and so a hole is formed in the back and that made in the front is filled up. The different processes were further illustrated by a beautiful series of prints of etchings some by the lecturer himself, some by other well known artists.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, March 7th.

H. W. Monckton, Esq., F.L.S., V.P.G.S. (O.W.) gave a lecture on the "Geological history of the Bergen District of Norway.

The lecturer said that Norwegian Geologists attributed the present surface features of their country mainly to the action of rain, snow, frost, and the agents of subaerial erosion, and believed that but a very small part of the work had been done by the sea. They recognised three stages in the reduction of the surface to its present contours.

First, there are several plateaux mostly now covered by perpetual snow and also a few mountain tops which have a level of from 5,000 to 6,500 feet and are believed to be the fragments of a very old land surface. This may be termed the *Oldest Land* and many English Geologists would probably be inclined to call it the remains of a plain of marine denudation.

Secondly, the various agents of subaerial erosion have carved out of this oldest land an undulating landscape with rounded hills and wide shallow valleys forming what Dr. Reusch has termed the *Palaeic Surface* of the Country. The formation of this service was probably due to earth movements, either to the elevation of Norway or to the depression of the North Sea area.

Thirdly, many earth movements of both elevation and depression have taken place and the net result is the elevation of the Palæic Surface to some 3,000 feet above its position

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when the main features of its sculpture were effected. In consequence of these elevatory movements the rivers and streams deepened their channels and produced the narrow and deep valleys in which the fjords lie. In many cases these *Fjord Valleys* have been cut along the bottom of a wide shallow valley of the Palæic Surface.

The Fjord Valleys are not open cracks or fissures in the surface, but nevertheless it is probable that they, in many, perhaps in most cases are excavated along lines of weakness or fracture in the earth's crust. The above are views held by Norwegian Geologists and the lecturer believed them to be correct, but they have not at present been accepted in this country and will not be found in English text books.

The lecturer then gave an account of some of the glaciers around the great snow field of Jostedal. These glaciers appear to be sometimes advancing and at other times retreating, but the evidence clearly shows that the net result is that they have retreated to a considerable extent during the last century, though perhaps not quite so much as the glaciers of the Alps.

The lecturer illustrated his remarks by a number of photographs taken by himself in different years.

A vote of thanks to the lecturer was proposed by Mr. Blundell.

Saturday, March 21st.

H. G. Armstrong, Esq., gave a lecture on "The Structure and Mechanism of the leg.

What Anatomists call the leg is really only that part which stretches from the knee to the ankle. The lower extremity consists of the "fibula" and "tibia" the last mentioned being the shin bone and the larger of the two. It is called "tibia" as it somewhat resembles a flute. "Fibula" is the Latin for a clasp, and is given as a name to the other bone as it tends to impart firmness to the other parts. There is one more bone to be mentioned, namely the knee-cap or "patella" which acts as a cover for the knee and is small, flat, and heart shaped. A bone is always hollow, and this hollow contains a substance known as marrow. Towards their extremities bones become solid, and the ends are composed of a sort of lattice work, the intertices being also filled with marrow. The thigh bone, the bone above the lower extremity of the leg, is joined to the body by what is know as a ball and socket joint; the joint consisting of a rounded bone fitting into a hollow, and therefore the leg at the thigh is capable of movement in every direction except that of its own length. The joint between the

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thigh bone and "tibia" is a hinge joint, so that here only a movement backwards and forwards is possible. Over the joints of bones there is a substance which deadens and prevents to a great extent the jars that are given in any violent exercise and which is known as the "cartilage"; when this coating gets caught in between the hinges of the knee through too violent exercise, considerable pain ensues. The joint between the "tibia" and foot is also a hinge joint, and so the foot can only move up and down. A muscle is composed of a large number of small fibres. Each fibre is enclosed in a small sheet of connective tissue, and each fibre is connected with the others and so muscle is formed. All muscles pass over at least one joint, and may pass over three. The connective tissue, as it reaches the top of the muscle, becomes very dense and keeps the muscle together, attaching itself to the bone. In passing over a joint, the muscles take the form of tendons and they are bound down by fibres. The muscles are all arranged in groups known as abductors, extensors, and circumductors. When we move we waste tissue, so to speak and to supply and make good this loss something must be reinstated. This is done by the circulation. Blood comes from the heart, of which there are two sides: one for pumping the blood through the arteries, and the right side for driving it into the lungs where it receive the oxygen we breathe to take down again into the system. The oxygen purifies the blood and so renews what was lost by the "waste." There is another form of circulation to which we are insensible. In addition to veins and arteries our bodies are supplied with "lymphatics." In vaccination the lymphatics swell and become very tender. They renew and remove impurities from the system. In addition to bones and muscles there is also a nervous system. All nerves are brought down through the spinal cord, and are composed of sensory and motory fibres. Thus if one burns one's finger a feeling of harm is at once conveyed to the brain through the sensory nerves, and the motory ones immediately carry back the order to take the finger out of the flame.

Mr. Kempthorne proposed a vote of thanks to the lecturer.

Saturday, May 16th.

The Rev. H. P. FitzGerald lectured on the "Dispersal of Seeds."

The lecturer started with a few general remarks on how Nature contrived to spread her vegetation. In the great struggle for existence those plants which have the best means

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of reproduction and spreading their offspring are the ones most likely to survive, and the great competition will present the most favourable opportunity for the self assertion of any useful variety. But amongst seeds it is not the most highly specialised that are the most successful, but those whose adaptations may best serve for dispersal either by wind, water, or animal agency. The chief methods of dispersion may be classed as follows: (1) Ejection by the plant; (2) Transport by water; (3) Transport by air; (4) Transport by animals.

The lecture was illustrated by a large number of slides, showing the various fruiting arrangements in mosses, fungi and many flowering plants and many devices for the propagation of spores and seeds were pointed out. After this the lecturer dwelt shortly on various insectivorous and carnivorous plants, both British and foreign; slides were exhibited to show the ingenious ways in which leaves and other portions of the plants had been modified, so as to be turned not only into traps and slaughter-houses, but also into veritable digesting organs.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

Saturday, May 30th.

A. Petrocokino, Esq. gave a lecture on "A Journey from Guayaquil across the Andes to the Amazon."

The lecturer had travelled first from Guayaquil to Quito, passing close to Chimborazo, and thence through the part of Ecuador known as St. Oriente, by the River Napo to the Amazon finally taking an ocean-going steamer at Para to return to England. Some idea of the difficulties encountered in this most adventurous journey may be gathered from the fact that no less than 744 miles had to be traversed from Quito before the Amazon was reached; of these, 78 miles were done on foot and 633 in canoes propelled along a dangerous river by Indians who were by no means expert or trustworthy. Torrents of rain, drunken attendants, tangled underwood, dismal resting places and scanty rations were the daily experiences, though much kindness was shewn to the traveller by various officials and traders, whose terrible isolation naturally excited his commiseration. The lecture was illustrated throughout by an admirable series of photographs, taken often under the greatest difficulty but helping themselves to a realisation of what these difficulties were in a way that no mere verbal description could accomplish.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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Saturday, June 13th.

G. E. Blundell, Esq. exhibited and described a series of slides representative of the Geology of the British Isles recently issued by the British Association.

A vote of thanks to Mr. Blundell was proposed by the President.

The President then exhibited a number of astronomical slides, including a series which had been only recently received from the Yerkes Observatory.

A vote of thanks was proposed by Mr. Kempthorne.

Saturday, July 11th.

A Conversazione was held in the Drawing School.

Amongst the most popular of the exhibits were a number of Sir William Crookes' Spinthariscopes, under the charge of Mr. Lemmey, which shewed the luminosity excited in a fluorescent screen by the rays given off by minute particles of Radium. At one end of the room a Japanese artist executed a number of wonderful and life like pictures of birds and flowers. Each picture occupied only from five to ten minutes in execution, and was produced by what seemed to be only a few dabs with a thick brush. In another part of the room was a large exhibit of photographic apparatus, and here from time to time demonstrations were given of various methods of printing, and of the use of a new developing machine. Mr. Hardcastle shewed and explained a number of orreries and also a calculating machine; Mr. Broomfield caused much amusement with a bicycle wheel mounted as a gyroscope; Mr. Gray had charge of a harmonograph the pen of which actuated by two pendulums swinging in planes at right angles to each other, executed series of beautiful curves. Mr. Blundell had a number of interesting microscopic slides, including a demonstration of the circulation in a frog's foot, and also shewed a live specimen of the rare Coronella lævis, or smooth-crowned snake, which had been recently captured. Other exhibits included series of photographs, Grecian pottery, butterflies and moths, and many Japanese works of art.

In an adjoining room Mr. FitzGerald gave demonstrations of the effects of the low temperature produced by solidified carbon dioxide. Mercury was frozen and a hook made of it strong enough to support a 100 gram weight. India rubber balls or natural flowers when placed in the carbon dioxide became as brittle as china.

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Saturday, October 3rd.

THE PRESIDENT gave a lecture on "Some Optical Illusions."

In order to understand the real nature of many Optical Illusions it is necessary to draw a clear line between sensation and perception. A sensation is the effect produced upon the senses by some external cause, the perception includes all that we have learnt to associate with that sensation as the result of past experience, it may be quite distinct from what we see or hear. When we say that we see water in a landscape, what we really see is usually the reflection of trees and clouds from which we infer that there is water, but sometimes this may be a false inference as in the case of a mirage, and then we have an illusion which is really one of perception and not of sensation. It is probable that the priests in ancient temples, used reflections from a column of smoke in order to give visions of gods and heroes to their worshippers. In 1877, Schiaparelli first discovered a number of long narrow markings on the planet Mars which he called canals, for some years no one else could see them, then one after another other astronomers detected them, until it was only the few who could not see them, but these few included some of the very best observers. Quite recently Mr. Maunder, of the Greenwich Observatory, had tried the experiment of drawing discs to represent some of the most prominent markings on Mars, and putting in faint markings and dots which might suggest canals, but no canals were drawn. These were copied by a number of boys stationed at various distances, and it was found that those who were nearest saw the markings as they were drawn, those who were furthest saw nothing of them, but those at the middle distances drew canals exactly like those which astronomers had seen on Mars. From this it would appear quite possible that the canals on Mars are really optical illusions. If a few thick parallel lines are drawn with a number of short thin lines crossing them at an angle of about 30°, and so that those crossing one line are in a different direction from those crossing the next, then the parallel lines appear to be no longer parallel. These are known after their discoverer as Zöllner's figures, and a variety of illustrations of them were shewn. There is another illusion known as irradiation in consequence of which a bright object appears larger than it really is. Thus the glowing carbon of an incandescent electric lamp appears much larger than the same carbon thread does when it is cold. A familiar illustration is that of the old moon in the arms of the new, where the old moon faintly illuminated by earth-shine appears

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to form part of a smaller disc than the brightly illuminated crescent. A beautiful photograph of this, taken by Professor Barnard at the Lick Observatory, was shewn upon the screen. Several illusions due to motion were also shewn, some of which illustrated the after effects, produced by looking at a waterfall or a rotating spiral.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, October 31st.

H. AWDRY, ESQ., gave a lecture on "Pictures from Greece."

The lecturer commenced with a description of a visit he had paid to Greece last Easter with a party of others in the ship "Argonaut." The route lay through the Corinthian Gulf, the Corinth Canal and round Cape Sunium. They visited the famous pass of Thermopylæ, and the gorge of Tempe; thence they crossed to Troy and after visiting Smyrna, Ephesus and Samos, they came to the small island of Patmos where S. John was exiled and where he wrote the Revelation. They then passed the sacred island of Delos, and after steaming through the submerged crater of Thera came to Cnossus in Crete; whence after visiting Canea, the capital of Crete, and Messene in the south of Greece proper, they returned home. The account of the journey was illustrated by a great number of slides including one of a mosque in Smyrna, several of Ephesus shewing the remains of the great theatre mentioned in the Acts, and the world-famous temple of Artemis, "Diana of the Ephesians." These were followed by a slide of the fine bronze statue recently recovered from an ancient wreck by some fishermen; it probably dates back to the first or second century B.C. Then came some beautiful photographs of Mount Olympus and the wooded gorge of Tempe, and another of a "Dug-out" canoe, still used for fishing, which they saw at a small village on the coast near Tempe. The next slide shewed the country on the opposite side of the Ægean Sea; there are several large mounds around Troy which are traditionally supposed to be the tombs of heroes of the Trojan war; the slide shewed that known as the tomb of Ajax. On the site of Troy the ruins of nine cities have been found; the sixth of these is the one immortalised by Homer; several photographs of the walls of these cities were shewn, and one of what was supposed to be the palace of Priam.

Passing on to the isle of Patmos, slides were shewn of the two great monasteries of the Apocalypse and of S. John, and

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one of the cave where S. John is said to have had his vision and to have heard the voice speaking to him through a fissure in the rock. Then followed photographs of the island of Thera or Santorin, a submerged volcano, on which are several populous towns; the soil is very fertile and the chief exports are concrete and wines.

Several interesting photographs were next shewn of the palace of Cnossus now being gradually excavated; amongst them was one of the throne room of King Minos, which has been partially restored, others of the great staircase and the galleries filled with the great jars in which Minos stored his goods; then some curious drawings, from gems, of the Minotaur, the great monster half bull, half man, kept by Minos and eventually killed by Theseus, and next an amusing terracotta image found in the palace. The Cretans of that day knew almost as much about drainage as we do, and their elaborate system was illustrated by several slides. After these came photographs of frescoes found there, and an out-door meeting-place, with stone seats, which was being excavated at the time of the lecturer's visit. Some slides of the beautiful art pottery of Palaikastro, in the east of Crete, excavated this year by the British School at Athens, followed; the designs were chiefly of marine subjects because the people of Palaikastro earned their living by catching the shell fish from which the purple dye was obtained; until lately it was supposed that the Phœnicians were the first to discover this dye. The last slide shewn was one of Mount Ithome, the citadel of Messene, where the party had been presented with a most amusing address which was read.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, November 21st.

Dr. W. J. S. Lockyer, F.R.A.S., gave a lecture on "Some uses of a small camera."

The lecturer said that he had chosen his subject because he thought that many of his hearers had cameras, and they would like to find a new use for them. He first took the subject of photography of stars. If a camera was mounted and the shutter opened it would record any bright object which passed before it. So if a meteor passed across the field of view of the camera it would be recorded on the plate. He showed photograps of how a camera or telescope was mounted equatorially and turned slowly by clock-work to counteract the motion of the earth, so that the stars appeared

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as round spots on the plate and not as streaks. Nearly all the meteors which one saw were burnt up before they reached the earth; about 40 million enter our atmosphere yearly, but only two or three actually fall to earth. Many of the best results were obtained by accident. A friend of the lecturer's was once taking a photograph of a star to see if he had got the focus of his camera right, when suddenly a splendid bolide, or meteor which burst, came right into the part of the sky he was photographing; one was able to see how it became more and more luminous until it burst and to trace the courses of particles till they were consumed. At the South Kensington Obervatory before the expected shower of 1899 they borrowed as many cameras as possible and mounted them at all angles so that they might catch any meteor that appeared. Meteors generally appeared to radiate from a certain point and if one got several meteors on one photograph this point could be fixed by producing their trails backwards.

Recently a new star appeared in the Constellation of Perseus. Photographs were taken from night to night of this constellation and the new star got brighter and brighter till it was the brightest in the group and then it quickly diminished.

The next photographs were of eclipses of the sun, and here the small camera showed much more extended results than the large and costly ones. The small camera showed the corona to extend out from the sun several diameters in length, while the large camera showed it for only a very short distance. By attaching a very fine grating to the camera and taking a photograph of the sun through it, it is possible to obtain a record of what elements are present in the sun. A record was produced to show that the sun contained Calcium, Sodium, Hydrogen and other elements.

Taking the subject of Lightning, the lecturer said that any plates would do to photograph with, he generally used Ilford or Imperial Ordinary. If the camera had a scale attached, the indicator should be fixed at infinity; if not it should be focussed on some distant speck of light such as a street lamp. Several flashes can be taken on the same plate. There are two kinds of flashes as reproduced on the photographs, Ordinary and Peculiar flashes. Of the former there are variations; stream flashes when the flash comes straight to earth; sinuous, which consist generally of one main flash with several tributaries; and there is another meandering kind which apparently wanders about considerably, but eventually comes to earth. The Peculiar kind does not really exist, but is due to the camera, or more often, the person working the camera. Of this kind, if it may be so called, there have been

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several variations: (1) beaded, a series of dots; (2) ribbon, bands of flashes; (3) multiple, a series of flashes; (4) dark flashes. The lecturer showed many photographs of all the kinds mentioned; some of them gave beautiful cloud effects. The reasons for the Peculiar kind were many, the main one being a bad lens; but also if the photographer held the camera and started when a particularly bright flash came near him, it often produced a curious effect. Dark lightning was caused by two or more flashes being taken on the same plate; the first flash came and left an ordinary impression, then came a second and reversed the former impression. This had been proved by taking photographs of sparks from a coil. Instead of the streak on the negative being black as it ought to be to produce the white positive, it had been turned white producing a black positive.

A vote of thanks to the lecturer was proposed by Mr. Kempthorne.

Saturday, November 28th.

O. T. PERKINS, ESQ. gave a lecture on "Photography of Mountains and Clouds."

The lecturer started by showing the cameras he had used in his work. They consisted of a 5 × 4 plate with a 17 inch extension; a quarter-plate with a 11 inch extension. The lenses in both were Ross Rapid Symmetrical. In the former, one of 7½ in. focus, in the latter of 4¾ in. He also had an ordinary folding pocket Kodak with a 5 in. focus, and a new glassplate Kodak with an extra long extension. He said that he had had experience in the Alps and Pyrenees, and that it was not really hard to take good photographs if one kept in mind three things: (1) Choose your subject well, with plenty of contrast; (2) get the sun right; (3) remember that you have to deal with a very clear, bright atmosphere; also that snow with sun upon it is the brightest object in nature. Where one would give a normal exposure in England, one would have to give a very fast one, from ·02 to ·01 of a second in the Alps. He always used Kodak films with the Kodaks; with the other cameras, a slow landscape film (Carbutt B), which could only be obtained direct from America; last time he went out to the Alps they arrived late, and he was forced to go without them. When not using films, he used ordinary Ilford plates. He then showed a series of photographs of mountains and glaciers taken in the Arolla and Zermatt districts. Many of these were very interesting from the geological point of view, especially those of the

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glaciers, which showed the moraines to perfection, and the extraordinary shapes the ice could assume. The photographs of the Matterhorn were especially beautiful; he had taken these with an ordinary Kodak camera, showing that it was not necessary to have a very expensive camera to get splendid results. The clearness of the atmosphere allowed distant objects to appear plainly. A photograph taken last Easter in the Pyrenees showed the beautiful effect of the reflection of a mountain in a lake. The greatest difficulty was to get distant objects to appear large enough on the plate. Often a distant mountain looked a most imposing sight, but in the photograph it appeared quite insignificant. This was due to two causes. The first was that the eye centres on the mountain and impresses it on the imagination; but the camera not being imaginative, shows everything in its real proportion with respect to the distance. The second was the use of a lens of too short focus. The shorter the focus is, the more appears on the plate, and consequently the smaller the objects. Also a lens of too short focus would interfere with the perspective. The focus was too short if shorter than the diagonal of the plate. In a quarter-plate camera the diagonal of the plate was 5¼ inches, consequently one should not use a lens of shorter focus than about 5½ inches. In a 5 × 4 camera the limit was a 6¼ inch focus. There are three ways of getting over this difficulty. The first is to buy a number of lenses, of different focal lengths. This, however, would become rather expensive, as the smallest good lens cost £4. Also weight has to be considered, when one has to carry a camera far. Here he showed a series of photographs of the Matterhorn, taken with lenses of different lengths, in order to illustrate that the longer the focus the larger the object becomes. The second way is, with a doublet lens, to use either the double combination, or to unscrew the front lens and use the back one alone. He showed photographs of this in practice. But there was a great objection to this method, because the speed varies as the square of the aperture divided by the square of the focal length, and since the single combination has a focal length twice that of the double, and the aperture is fixed, therefore four times the exposure is necessary with the single combination. The third way is to have a Telephotographic attachment. This consists of an extensible tube to one end of which the double lens can be screwed; the other end has a negative lens (that is a lens which does not throw an image). By means of this attachment the optical centre can be thrown farther from the plate, thus increasing the focal length of the lens. This gives a great range of focal length. With a 6 inch doublet lens, there is first the double combi-

nation of 6 inch focus; then, using the single combination, we have a 12 inch focus. If a telephotographic attachment is added the shortest focal length available is 17 inches and the greatest 36 inches, and by simply turning two screws which extend the tube and the camera, we can vary it to anything between 17 and 36 inches. The photographs which followed showed the advantages to be got from the possession of one of these useful attachments. Clouds could be got with all kinds of plates, but Mr. Perkins thought that the best were Orthochromatic Plates. In bad weather in the Alps one should never leave the camera behind, even if one only took a small Kodak. On one such occasion, Mr. Perkins took his small camera with him; the clouds cleared off in the afternoon, and he was fortunate enough to get some beautiful photographs of the North face of the Matterhorn, with a huge "banner" cloud streaming away from the East face.

Saturday, December 5th.

The REV. G. B. CRONSHAW gave a lecture on "Coals and Coal-Mining."

The lecture was to have been on Surface Waves, a subject to which Mr. Cronshaw had given a good deal of attention, and he had sent a number of photographs to Newton's with instructions to have slides prepared from them in time. He had only learnt that morning in reply to a telegram that the slides were not ready, and he had been obliged to substitute the only subject on which he could find a suitable series of slides in Oxford.

The views commenced at the eye of the pit. Some pits are more than a mile deep, and the weight of a mile of steel wire cable is so great that very well constructed machinery is required to take it. When the cable is wound it comes first on to the winding drum, but as each coil is laid round the drum under a very great tension, if all were wound straight on to the drum the pressure would be enormous and the drum would collapse, so the cable is gradually wound off on to another drum. Great precautions have to be taken in order that the cage may not get over-wound, the neglect or absence of these has been the cause of many accidents. The cage usually consists of two platforms one above the other; the descent is made very rapidly, and the sensation at first very curious, ladies sometimes have to be held; when the cage begins to slow up, the occupants feel as if they were going through the bottom. The shaft is usually continued some 30

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ft. below the landing stage, for the sake of drainage and sometimes, when the cable has broken the water at the bottom has saved the occupants from destruction. This water is usually pumped up to a reservoir, half way up the shaft, and thence again to the top, electricity providing the motor power. Ventilation is another point which demands very careful consideration; usually there are two shafts, and at the bottom of one a fire is kept burning which produces a current of heated air up the shaft. To take its place air enters down the other shaft and is drawn along the galleries. If a visitor touches the baulks of timber which support the roof, he gets covered with a fine black powder, as fine as French chalk, which gets into the pores of the skin and is very hard to remove: this coal dust, which is worst in cannel coal, will carry a wave of explosion to a very great distance from its source; the precautions taken are to sprinkle it with water, in which either salt or calcium chloride may be dissolved. When an explosion occurs the marsh gas and coal dust burn to carbon dioxide or "after damp," in which no animals can live, but in order to enable men to pass along the galleries tubes of compressed oxygen are kept at intervals, and by making use of these the survivors are enabled to reach the shaft. A pit is always examined before the men go down to work; this is effected by holding a Davy lamp near the roof; marsh gas being lighter than air, accumulates here and the percentage present may be accurately gauged from the length of the flame in the lamp. It is also necessary to see that the timber baulks which support the roof have not sprung under the enormous pressure on them. The removal of the rubbish from the pit is often a source of trouble; the owners do not see why they should pay for what is of no use to them, whilst the men contend that it has to be removed in order to get at the coal, and therefore they should be paid for doing it.

The quality of coal varies according to the conditions under which it has been laid down, and the pressure to which it has been subjected; the stages through which it passes are those of wood, peat, lignite, bituminous coal, anthracite and carbon.

The fauna found in coal consist of shells, amphibians, and the lower classes of fishes, indicating that there was plenty of water where it was laid. The flora are all of a fern or gigantic moss type, indicating either a warm damp climate like that of our present tropical areas, or else that the ferns and mosses had degenerated. The best proof that coal is vegetable matter is that from the clay which lies directly under the coal seams all the alkalies and other plant foods have been extracted. In consequence of the extraction of the alkalies these clays stand a high temperature without fusing

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and are therefore used as fire clays. Further evidence has been obtained from a pit in Pennsylvania, in which it was found, after long disuse, that the baulks, having been surrounded by water and under great pressure, were converted into a type of lignite. In another case it was found that the timber piles forming the foundation of a Nasmyth hammer had also been converted by pressure and moisture into lignite.

When the ponies used in the galleries are brought to the surface, they are kept for some ten days in stables dark at first but into which light is gradually admitted, even with this precaution it is found that they sometimes remain permanently blind.

A vote of thanks to the lecturer was proposed by Mr. FitzGerald who said that Mr. Cronshaw had promised to come again and give the lecture on Surface Waves.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Monday, February 2nd.

At a P.B.M., H. W. T. Palmer, E. C. Harrison, G. S. Harris, K. W. Lee, H. F. F. Marsh, J. P. G. Worlledge, R. A. Peters, J. Kennedy, H. K. Griffith, A. B. Floyd, A. L. Auchinleck, C. S. S. Malden, J. H. Hay, S. R. C. Plimsoll, F. B. Binney, A. J. Usborne, J. S. Barkworth, M. C. Chalart, R. P. Tweedy, F. M. G. Griffin, J. H. Brougham, G. G. Petherick, M. P. Beadnell, W. H. Carew, R. G. W. N. Bulkeley, R. C. C. Liston, W. R. Gunning, E. H. S. Stanhope, were elected Associates.

At a Committee Meeting, H. Anton, E. W. P. Mills, were elected Members.

Wednesday, May 13th.

At a P.B.M., A. W. M. Jesson, W. A. S. Rough, C. W. Trevelyan, R. R. Forde, H. Brougham, J. C. Swayne, T. P. E. Fenwicke Clennell, H. G. Whitmore, R. R. de C. Grubb, M. D. Vigors, A. R. Forsyth, H. L. Bazalgette, R. H. Muir, W. C. K. Megaw, R. W. D. Sandford, G. Jeffreys, C. R. Watson, N. B. P. Shore, A. A. Heyland, E. H. P. Hanham, C. M. Forster, G. A. Fuller Maitland, F. H. Huleatt, C. T. Carfrae, A. A. Cole, L. Field, L. R. Fowle, J. R. V. Sherston, A. V. Olphert, H. R. Lawrence, B. L. Clarke, J. Cooper, W. W. Taylor, L. B. Irwin, A. E. H. Fetherstonhaugh, H. F. North, W. E. Pain, R. M. Derry, L. Lawrence Smith, H. G. Keswick, E. P. F. Schweder, W. T. S. Grigson, C. T. A. Pollock, H. F. Treeby, G. F. C. Shakespear, W. M. Fowle, H. L. B. Lovatt, A. G. Paterson, J. A. Southey, A. J. Peareth, H. W. Crippin, J. C. W. Francis, E. V. Pringle, G. J. D. R. Cruden, G. A. Anstey, J. Bell Irving, B. A. D. Kinahan, J. H. Curell, W. F. C. Peake, G. C. K. Campbell, H. P. A. Hagreen, R. H. Hill, were elected Associates.

J. F. C. Sanders and H. Knox Shaw were elected Judges for the Pender Prize.

At a Committee Meeting, H. W. T. Palmer was elected a Member.

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Saturday, June 13th.

At a P.B.M., E. B. Williams, T. Hare, P. M. Monckton, T. F. Sandeman, A. F. Chapman, R. B. Walker, N. Kennedy, R. W. M. Bannerman, R. A. Scott, C. E. Fox, F. E. Buller, L. D. G. Alexander, G. J. L. Buxton, A. Robinson, G. J. J. Jameson, R. W. Henderson, were elected Associates.

Monday, September 28th.

At a P.B.M., H. G. Nicolson, J. M. Burchell, A. S. C. Trench, M. M. Magrath, J. F. P. Butler, G. W. P. Money, H. F. Lang, P. Helyar, F. H. W. Jackson, I. K. Thomson, A. C. P. Butler, Ll. Jones Bateman, R. C. Money, W. Astell, E. H. S. Stanhope, F. V. Owen, G. D. G. Elton, J. B. Bolitho, were elected Associates.

Votes of thanks were passed to J. F. C. Sanders and W. S. E. Money, the retiring Secretary and Treasurer.

R. G. Dainty was elected Secretary.

H. Knox Shaw was elected Treasurer.

At a Committtte Meeting, J. C. Armstrong, V. E. Inglefield, A. E. Watkin, H. P. R. Foster, J. P. G. Worlledge, L. B. Irwin, L. Lawrence Smith, J. H. Curell, were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus chosen by the winner, subject to the approval of the President.

The winner may, if he chooses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *boná fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President, and obtain his sanction, before sending in the essay.

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6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1903 was not awarded.

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the N.S.S., for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). Each collection must be accompanied by a note-book giving dates and localities for all the specimens and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of National History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

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III. One or more prizes are offered by the N.S.S. to Members of the Field Club for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming these or any other specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1903, the prize in Group I was awarded to J. H. Curell.

In Group II the first prize was awarded to J. P. G. Worlledge, the second to A. W. M. Jesson.

In Group III the prizes were awarded to L. B. Irwin and L. Lawrence Smith who were adjudged equal: *proxime accessit* R. R. Forde.

Photographic Prizes.

Mr. Kempthorne offered a prize, value £1, to Members of the Photographic Section, for the best photograph considered as a picture, both negative and print being the work of the competitor.

The prize was awarded to T. Hare for a photograph of the Lantern of Ely Cathedral: *proxime accessit* R. H. Hill with "A view in a wood."

Mr. Blundell offers a prize, value £1, to Members of the Photographic Section, for the best photograph of some Natural History subject. In making the award the difficulty of obtaining the picture will be taken into account. The prize will be awarded in July, 1904.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·61	46·9	26·6	34·2	34·1	99	8	·02	N.W.
2	·50	51·1	31·5	46·4	46·2	99	10	·02	S.W.
3	·47	48·2	44·5	46·7	45·9	94	10	·14	S.W.
4	·81	53·9	38·7	42·7	41·2	88	10	·67	S.
5	·69	53·1	42·2	52·1	51·8	98	10	·04	S.W.
6	·51	51·4	48·9	51·4	50·2	92	10	·07	S.W.
7	·35		45·2	49·3	46·6	81	8		S.W.
8	·69	45·9	31·3	34·2	33·8	95	10	07	S.E
9	·41	51·3	33·6	44·4	43·7	94	5	·05	S.
10	·37	47·4	41·4	43·1	41·5	87	0	·18	S.W.
11	29·63	39·2	32·9	33·2	32·2	88	7		N.E.
12	30·08	35·5	28·2	29·4	28·8	89	0		N.
13	·33	33·4	24·0	26·3	25·9	90	8		N.
14	·46	31·1	25·6	26·9	25·5	70	0		N.E.
15	·35	31·9	16·1	24·7	24·7	100	0		E.
16	·24	33·4	20·1	25·4	25·1	92	0		S.E.
17	·05	34·7	24·5	27·1	26·9	96	10	·22	E.
18	·08	39·6	27·7	34·9	34·8	98	10	·02	N.E.
19	·14	42·9	35·3	39·4	39·4	100	10	·02	E.
20	·22	41·9	39·7	39·9	39·9	100	10	·05	E.
21	·27	41·7	36·0	37·7	37·7	100	10	trace	N.E.
22	·07	44·1	37·4	41·1	40·9	98	10	·13	N.E.
23	·05	47·1	32·9	38·9	38·1	93	10	·01	S.W.
24	·07	48·3	36·3	46·1	44·9	91	10	·04	W.
25	·07	50·2	46·1	47·7	45·7	85	10	·04	S.W.
26	·19	50·9	42·4				10		S.W.
27	·13	51·2	49·2	50·5	48·8	89	10	·40	S.W.
28	·13	49·2	37·7	43·7	42·5	90	3	trace	S.W.
29	·38	49·1	39·4	45·7	43·5	84	2		W.
30	30·29	50·2	43·4	46·1	44·2	86	8		S.W.
31	29·94	45·7	38·7	42·2	40·7	87	10	·25	S.W.
Mean	29·95	44·7	35·4	39·7	38·8	92	7·4	Total 2·44	
Mean for 21 years	29·96	43·3	32·5	37·7	36·8	90	8·3	1·98	

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FEBRUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	29·83	43·1	36·6	37·2	36·3	94	8		S.W.
2	29·90	42·9	27·6	36·5	34·3	80	6	trace	S.W.
3	30·29	47·1	31·5	42·1	41·7	97	10		S.W.
4	·37	47·1	31·3	45·7	44·2	89	10	trace	S.W.
5	·37	47·2	43·4	46·4	44·7	87	10		S.W.
6	·03	50·2	36·8	45·1	43·1	85	5	·02	S.
7	·04	50·9	42·4	48·5	48·2	98	10	·02	S
8	·12	54·2	47·9	51·1	50·3	94	10		S.W.
9	·38	56·2	49·8	52·1	51·0	93	10	trace	S.W.
10	·62	54·1	46·6	50·2	48·2	86	10		S.W.
11	·51	54·5	43·0	48·4	47·2	91	10		S.W.
12	·29	54·5	41·2	50·9	47·8	79	10		S.W.
13	·45	46·2	28·7	38·1	37·9	98	10		N.E.
14	·13	48·7	33·3	45·1	43·1	85	10		N.E.
15	·02	48·1	43·4	44·9	42·4	81	10	·03	N.W.
16	·30	43·1	38·6	39·9	39·3	95	10		S.E.
17	·61	46·4	30·5	40·9	37·7	75	10		S.W.
18	·48	50·9	24·3	41·7	39·1	84	8	trace	S.W.
19	·32	56·7	34·1	50·2	47·8	83	6		S.
20	·32	59·1	47·3	53·9	49·3	71	5		S.
21	·09	54·7	50·2	53·1	51·2	87	10	·01	E.
22	30·06	52·1	41·2	47·4	47·0	97	10	·26	S.W.
23	29·70	48·2	41·0	43·3	41·1	83	7		W.
24	·91	49·1	32·3	47·4	44·1	78	7	·19	W.
25	·78	53·2	42·2	47·4	43·9	76	0	·17	S.W.
26	·72	49·7	40·2	45·4	41·9	76	8	·24	S.
27	·53	49·9	36·5	49·1	45·1	73	10	·25	S.W.
28	29·48	46·1	35·5	37·1	36·8	97	10	·06	S.W.
Mean	30·11	50·1	38·5	45·7	43·7	86	8·6	Total 1·25	
Mean for 21 Years	30·00	45·3	32·3	38·2	37·0	89	7·8	1·77	

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MARCH.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·65	48·1	31·7	44·3	42·2	84	10	·42	S.W.
2	·12	50·1	32·3	46·1	45·4	95	10	·35	S.
3	·21	51·1	40·2	41·9	40·2	87	10		N.E.
4	·81	53·4	32·1	50·9	48·5	83	8	·22	S.W.
5	29·78	49·1	45·0	45·2	45·2	100	10	·14	S.W.
6	30·10	50·1	32·1	43·7	40·5	77	6	·55	S.
7	29·80	44·9	34·3	41·5	40·5	92	10	·02	S.
8	30·24	47·5	32·3	39·4	37·3	83	0		N.W.
9	30·15	46·9	30·5	45·2	42·9	83	10	·14	S.
10	29·93	47·1	40·4	41·7	41·5	98	10	·03	S.W.
11	·94	51·4	29·3	46·0	42·9	78	4	trace	S.W.
12	·92	54·5	31·6	46·7	45·1	88	6		N.E.
13	·91	57·8	36·5	53·9	48·2	66	5		N.E.
14	·89	58·0	34·5	45·4	43·9	89	10	·11	S.
15	·79	51·4	32·7	42·6	40·9	87	5	·01	S.
16	·66	51·1	35·8	45·2	41·7	75	7		W.
17	·75	50·1	34·3	47·4	44·7	80	10	·32	S.
18	29·79	50·5	40·0	44·1	40·2	72	8	trace	S.W.
19	30·09	54·9	40·7	49·9	47·8	86	8	·01	S.W.
20	·20	56·2	43·2	54·5	49·5	69	10		S.W.
21	·08	55·4	44·8	49·7	45·7	73	10		S.W.
22	30·08	61·2	47·1	49·6	48·8	94	10		S.W.
23	29·81	57·3	48·3	56·3	51·3	70	5	·48	S.W.
24	·78	59·2	37·2	47·6	45·1	82	6	·03	W.
25	·48	65·8	43·4	58·9	54·0	72	5	·32	S.E.
26	·39	55·1	45·2	50·5	47·0	76	10	·13	S.E.
27	·41	53·9	41·5	45·7	45·5	99	10	·06	N.W.
28	29·58	54·9	43·5	52·2	50·3	87	10	·18	N.W.
29	30·05	56·1	39·4	47·6	44·1	76	2	·27	W.
30	29·84	52·2	41·8	45·3	41·9	76	10	·03	W.
31	30·14	53·5	41·4	49·2	46·2	79	10	·02	N.E.
Mean	29·82	53·2	38·1	47·4	44·8	82	7·9	Total 3·84	
Mean for 21 years	29·88	49·4	33·3	43·6	39·6	83	7·3	1·79	

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APRIL.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·89	50·9	38·2	45·5	45·1	94	10	·15	S.
2	29·71	50·1	40·7	46·4	42·7	74	10		N.E.
3	30·06	52·9	29·3	47·1	46·4	95	10	·08	S.W.
4	29·87	54·7	45·7	48·9	48·2	95	10	·07	S.W.
5	30·06	53·1	37·2	45·1	40·6	69	2		N.W.
6	30·06	52·7	36·3	50·7	47·2	77	10		S.W.
7	29·89	54·2	46·3	50·4	46·2	72	10	·02	S.W.
8	30·08	55·9	36·1	49·2	43·9	66	2		N.E.
9	·20	53·1	36·5	49·9	44·9	68	6		N.E.
10	·30	55·1	31·3	46·1	43·4	80	10		S.W.
11	·14	50·9	44·8	49·9	47·2	81	10		W.
12	30·02	51·1	33·1	45·4	40·5	66	2		N.W.
13	29·89	45·9	30·0	41·7	37·2	67	10	trace	N.W.
14	·98	47·9	28·6	40·9	36·6	68	7	·09	N.W.
15	29·92	46·2	35·8	40·5	38·1	81	10		N.
16	30·14	45·9	23·5	40·1	36·0	69	5		N.
17	·30	45·9	25·0	39·3	34·1	62	5		N.
18	·36	48·7	23·7	38·6	34·2	66	0		N.
19	30·24	53·3	24·5	43·7	39·2	69	0		N.
20	29·92	56·2	27·0	50·4	45·2	66	0		S.W.
21	·55	50·1	34·5	48·4	44·2	72	10		E.
22	·48	49·1	31·5	44·9	40·2	68	8		S.E.
23	·48	47·4	26·2	45·4	40·4	66	6		N.E.
24	·66	53·1	29·5	44·1	39·9	71	10		N.E.
25	·68	59·0	28·4	52·2	50·5	88	4	·35	N.
26	·49	50·2	40·2	42·9	42·7	98	10	·40	N.E.
27	·33	57·8	42·0	49·7	48·3	90	10	·10	S.W.
28	·57	60·0	41·2	56·9	55·2	89	10	·65	S.W.
29	·38	58·8	45·9	56·5	55·5	93	8	·17	N.W.
30	29·44	57·4	45·3	54·1	53·1	93	8	·20	S.W.
Mean	29·87	52·3	34·6	46·8	43·6	77	7·1	Total 2·28	
Mean for 21 years	29·88	55·7	36·7	47·8	44·4	78	7·0	1·44	

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MAY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·40	54·7	45·3	49·5	49·3	99	10	·12	S.W.
2	·65	58·4	43·4	51·4	49·6	88	8	·32	S.W.
3	·44	53·1	45·9	47·9	47·9	100	10	·61	S.
4	·26	62·1	42·7	50·6	50·5	99	10	·03	S.E.
5	·25	58·1	42·4	53·1	51·2	87	10	·17	S.
6	·48	57·6	46·3	56·9	52·2	72	10	·21	S.
7	·65	59·0	46·1	52·9	50·0	80	10	·03	S.
8	·65	60·0	35·5	55·1	50·6	72	10	trace	N.
9	·69	55·9	38·5	51·7	49·0	81	10	·04	N.E.
10	·73	56·1	37·0	47·9	46·1	87	10	·07	N.W.
11	·79	49·2	41·4	42·6	42·2	97	10	·02	N.
12	·84	58·0	38·4	46·7	42·4	71	10		N.E.
13	29·89	58·1	31·5	56·1	49·5	62	10	trace	N.E.
14	30·04	57·8	45·9	53·7	50·6	80	10	·02	N.E.
15	·16	61·1	48·3	52·2	49·5	82	10	trace	S.W.
16	30·19	53·3	36·5	51·1	47·2	74	10	·26	S.W.
17	29·70	54·9	41·8	45·2	43·4	87	10	·05	N.W.
18	30·09	59·8	33·8	52·3	47·2	68	5		N.
19	30·00	62·0	34·5	58·9	49·2	50	2		N.W.
20	29·97	65·8	37·8	59·1	53·6	68	2		N.W.
21	30·19	73·7	43·4	62·7	56·2	65	2		N.W.
22	·15	77·2	48·3	73·1	61·2	49	0		S.E.
23	·38	68·7	46·6	61·9	54·2	60	0		S.W.
24	·39	65·1	37·2	53·9	49·6	73	0		N.E.
25	·31	69·9	31·0	57·5	51·0	64	0		E.
26	·27	68·9	43·4	64·1	56·0	59	0		N.E.
27	30·14	69·9	43·0	61·5	56·2	71	10		N.E.
28	29·89	66·1	43·0	63·1	58·1	72	10	·29	N.E.
29	·78	72·2	51·8	57·1	57·1	100	10	·04	S.
30	·79	78·3	54·2	71·9	64·9	65	10	·47	S.
31	29·82	73·4	57·1	58·9	57·7	90	10		N.E.
Mean	29·87	62·5	42·3	55·5	51·4	76	7·4	Total 2·75	
Mean for 21 years	29·96	61·7	42·3	54·1	49·8	74	6·8	1·75	

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JUNE.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·83	79·2	50·6	66·7	61·2	71	0		N.E.
2	30·02	61·8	50·2	58·7	53·3	69	10		N.E.
3	·28	58·1	39·7	49·1	45·1	73	10		E.
4	·39	67·1	34·8	57·9	51·2	62	2		S.W.
5	·35	69·1	43·6	66·4	60·0	66	6		S.W.
6	·39	61·8	50·3	54·7	50·8	76	5		N.E.
7	·32	61·0	39·7	52·1	48·7	78	7		N.E.
8	30·18	65·3	45·8	58·9	50·8	57	5	·45	N.E.
9	29·79	65·0	48·4	53·7	53·7	100	10	·36	N.
10	·82	58·3	52·2	55·5	54·4	93	10	1·21	N.W.
11	29·86	53·5	52·0	53·4	53·3	99	10	·59	N.W.
12	30·04	56·9	48·5	51·7	46·7	69	10		N.E.
13	29·95	57·2	39·5	56·5	53·5	81	10	·88	N.E.
14	·81	50·5	43·4	46·9	46·7	99	10	·82	N.
15	·69	56·1	47·6	50·5	50·2	98	10	1·29	N.W.
16	·61	60·1	45·4	55·2	51·2	75	8	trace	S.W.
17	·76	66·8	42·0	58·9	53·2	67	5	·30	N.W.
18	·71	59·1	41·4	54·1	49·2	70	10	·03	N.E.
19	·55	59·4	45·4	47·1	46·2	93	10	·74	E.
20	29·81	52·4	44·6	49·4	46·6	78	10	trace	N.E.
21	30·14	60·1	38·9	50·9	46·1	69	6		N.
22	·25	67·7	37·0	59·9	52·2	59	4		N.W.
23	·17	67·4	41·4	63·1	55·8	62	8		S.W.
24	·00	68·2	52·3	61·1	57·0	76	10		S.E.
25	·14	70·9	48·1	62·4	57·4	72	6		S.W.
26	·21	76·1	51·2	68·4	61·9	67	8		S.W.
27	·14	81·6	55·8	75·5	69·8	71	5		S.W.
28	·08	79·9	60·6	74·4	66·1	61	5		S.
29	·27	71·1	50·2	64·5	57·7	64	2		N.W.
30	30·36	72·2	47·9	67·1	58·4	58	6		N.W.
Mean	30·03	64·5	46·1	58·2	53·6	74	7·3	Total 6·67	
Mean for 21 years	30·05	68·2	47·5	60·1	55·5	75	7·0	2·00	

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JULY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·35	75·4	47·7	68·4	61·2	64	5		N.W.
2	·10	79·9	48·3	74·2	64·1	55	8		N.W.
3	·10	69·4	56·3	65·1	57·4	60	10		N.W.
4	·19	69·6	48·3	62·7	55·2	61	5		S.W.
5	30·03	67·3	53·5	57·9	55·2	83	10		W.
6	29·84	63·0	53·3	58·7	52·3	64	3	trace	N.W.
7	30·08	65·1	43·7	56.1	55·0	92	8		N.W.
8	·27	71·9	40·8	64·4	56·3	60	3		N.W.
9	·33	77·2	62·4	71·9	65·1	66	5		N.W.
10	·34	83·2	57·3	76·4	69·3	66	2		S.W.
11	·22	83·4	56·2	77·1	69·8	65	2		S.E.
12	30·01	66·0	59·1	61·2	59·7	90	10	·02	N.E.
13	29·96	64·6	40·9	57·3	52·0	69	8		N.W.
14	30·01	67·2	42·5	63·3	55·5	59	10	trace	N.W.
15	29·91	72·9	51·2	65·4	59·1	67	10	·04	N.W.
16	·71	65·1	51·8	58·1	56·5	89	10	·05	S.
17	·62	69·7	54·2	64·9	60·9	77	10	·47	N.E.
18	·65	69·2	56·2	57·1	57·1	100	10	·30	N.E.
19	29·85	69·4	52·7	57·7	57·0	95	10	·21	S.E.
20	30·02	63·0	54·2	57·1	56·8	98	10	trace	S.E.
21	30·15	69·9	45·4	61·7	58·1	79	10	·05	S.W.
22	29·94	70·1	58·3	62·9	60·9	88	10		S.W.
23	·77	64·8	51·3	62·7	58·4	75	10	·70	N.E.
24	29·84	69·9	52·3	62·1	57·5	74	5		N.W.
25	30·03	68·9	44·5	65·7	59·4	67	10	·72	N.W.
26	29·79	69·3	56·8	58·4	58·1	98	10	·06	S.W.
27	·88	62·1	46·3	59·2	57·4	89	10	·12	S.
28	·72	61·6	53·2	59·9	57·4	84	10	·28	S.W.
29	·66	65·1	54·3	57·7	57·2	96	10	·15	S.
30	·74	63·3	49·1	60·1	55·5	73	10	·05	S.W.
31	29·97	62·0	54·2	57·1	53·2	76	10	·01	S.W.
Mean	29·97	69·0	51·5	62·7	58·4	77	8·2	Total 3·23	
Mean for 21 years	29·99	70·6	51·3	63·0	58·5	76	7·0	2·21	

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AUGUST.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·06	69·4	52·5	59·1	57·1	87	6	·04	S.W.
2	30·00	68·7	54·0	62·9	59·1	78	5	·15	S.W.
3	29·70	69·2	54·3	63·1	61·1	88	8		S.W.
4	29·93	69·1	51·3	61·9	60·4	91	10		S.W.
5	30·06	67·4	51·8	64·7	58·4	66	10		S.W.
6	·24	68·7	48·4	63·9	56·8	62	8		S.
7	30·20	72·7	41·2	64·9	56·2	57	0		S.E.
8	29·91	75·8	49·1	72·2	62·4	54	8		S.E.
9	·82	69·4	52·5	63·7	58·9	73	8	·14	S.E.
10	·76	66·0	52·0	63·2	57·4	68	6	·05	S.E.
11	·95	62·1	45·4	60·7	60·1	96	5	·73	S.E.
12	·91	69·9	52·5	62·1	59·9	86	5		S.E.
13	·97	71·0	45·4	64·4	63·7	96	2	·21	S.E.
14	·48	68·1	50·6	60·9	60·9	100	10	·11	S.E.
15	·35	74·9	55·0	59·9	55·4	74	10	·05	W.
16	·31	64·9	49·8	59·0	54·0	71	4	·28	S.W.
17	·65	70·8	53·3	62·9	57·9	72	4	·06	S.E.
18	·55	64·0	53·1	58·8	54·9	76	8	·16	N.W
19	·71	66·8	49·3	56·8	55·5	91	7	trace	S.W.
20	·81	60·8	50·5	57·1	55·0	86	10	·21	N.W.
21	·64	65·3	50·8	59·4	53·7	68	5		S.E.
22	·87	68·4	41·8	62·3	54·0	57	4		E.
23	·88	66·8	40·4	57·9	54·3	78	8	·36	N.E.
24	·69	64·6	48·1	53·2	53·0	99	10	·08	S.E.
25	29·79	60·3	52·3	55·3	53·5	71	10	·03	N.W.
26	30·23	66·5	40·4	58·7	55·7	82	5		S.W.
27	·14	67·9	54·0	63·1	57·4	74	5	·08	W.
28	30·05	67·7	53·4	58·1	56·0	87	10	·11	W.
29	29·89	66·5	57·1	59·9	55·2	73	4		N.W.
30	30·15	62·1	49·2	58·7	56·2	84	10	·08	S.W.
31	30·04	71·9	57·1	61·9	56·8	72	5		S.W.
Mean	29·88	67·7	50·2	61·0	57·1	78	6·8	Total 2·88	
Mean for 21 years	29·95	70·0	50·7	62·0	58·1	77	6·9	2·21	

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SEPTEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·98	80·7	54·6	72·2	67·1	74	0		S.E.
2	29·83	81·1	56·8	71·3	67·1	78	7	·30	S.
3	30·11	68·2	47·6	60·2	56·0	75	5		S.W.
4	30·08	70·4	50·4	62·1	60·1	88	3	·48	S.
5	29·82	67·5	57·1	61·7	61·1	96	10		S.W.
6	30·10	59·8	42·0	50·4	50·0	97	10		S.
7	·23	67·6	40·5	57·1	53·2	76	0		N.W.
8	30·15	65·0	52·6	62·2	57·9	75	8	·11	S.W.
9	29·77	63·5	56·0	59·4	54·2	70	7	·04	N.W.
10	30·00	57·3	43·2	54·7	49·7	69	10	·50	N.W.
11	29·49	57·1	36·8	52·5	47·7	70	8	·02	N.W.
12	·62	56·6	37·4	53·7	48·6	69	6		W.
13	29·73	56·6	41·5	50·7	47·3	77	5		N.E.
14	30·25	56·2	37·6	51·9	47·2	71	2		N.
15	·45	55·1	37·7	49·4	46·4	79	8		N.
16	·26	57·2	38·2	49·2	47·6	88	10		N.E.
17	·23	63·3	45·9	55·4	50·0	68	10		S.
18	·32	65·0	50·6	60·6	53·6	62	0		S.E.
19	·09	68·8	56·0	60·7	54·5	65	8		N.W.
20	30·03	70·1	53·0	60·7	57·2	79	5		S.E.
21	29·94	67·9	55·5	63·9	57·4	65	5	·03	E.
22	29·99	64·8	55·2	60·9	59·7	92	10	trace	S.
23	30·28	67·9	57·1	59·4	58·9	97	10		S.
24	·28	68·1	57·9	60·9	60·2	95	10	·14	S.
25	·14	66·8	51·2	61·7	59·4	85	10	trace	S.W.
26	30·25	67·1	51·5	59·7	54·0	68	10	·26	S.W.
27	29·97	67·1	56·0	57·1	57·0	99	10	·02	S.E.
28	·92	68·9	58·1	60·4	59·1	91	10	·15	S.
29	·76	65·0	53·2	64·1	63·1	94	10	·12	S.
30	29·94	67·1	51·3	63·1	58·5	74	10	trace	S.
Mean	30·03	65·1	49·4	58·9	55·5	80	7·2	Total 2·17	
Mean for 21 years	30·02	65·6	47·7	58·2	55·2	82	7·0	1·89	

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OCTOBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·86	63·8	51·3	59·0	58·1	94	10	·17	S.W.
2	·79	63·3	49·0	57·4	53·6	77	8	·05	S.W.
3	·72	65·0	56·7	59·1	57·9	92	8	·11	W.
4	·65	63·4	51·0	57·2	56·0	92	10	·47	W.
5	·60	61·8	53·5	59·4	58·1	91	10	·14	S.W.
6	·65	61·3	52·2	56·9	56·5	97	10	·19	S.W.
7	·90	61·6	51·2	58·2	54·5	77	10	·22	S.W.
8	·58	60·4	52·8	60·1	58·5	90	10	·55	S.W.
9	·59	58·0	47·6	56·3	51·0	69	10	·02	S.W.
10	·87	56·4	36·6	50·9	47·8	79	10	·19	S.
11	·59	57·0	43·4	51·6	51·2	97	10	1·40	S.E.
12	·07	59·8	50·6	53·6	53·0	96	10	·11	S.
13	·49	58·0	48·3	53·7	49·3	72	5	trace	S.W.
14	·55	57·2	47·4	56·9	53·6	79	10	·53	S.W.
15	·56	57·0	47·5	53·1	49·2	75	10		S.W.
16	·71	55·9	42·2	52·9	47·8	68	10	·03	S.W.
17	29·81	54·6	45·4	50·3	47·0	78	10	trace	N.E.
18	30·05	53·9	39·2	48·4	46·4	85	10	·15	W.
19	30·03	54·9	45·6	51·2	50·0	92	10	·22	S.W.
20	29·92	54·2	50·3	52·2	52·2	100	10	·20	S.E.
21	·73	54·2	47·3	52·1	52·0	99	10	·30	S.E.
22	·45	55·9	42·4	53·1	50·8	84	10	·08	S.W.
23	·48	51·4	41·7	49·9	47·2	81	6	trace	S.W.
24	·75	54·6	34·3	49·1	46·2	80	8	·50	S.
25	·45	55·6	44·4	52·1	51·8	98	10	·19	S.W.
26	·29	53·4	51·0	52·1	51·3	94	10	·32	S.
27	·38	57·0	44·4	51·3	50·5	98	10	1·05	S.
28	·21	54·7	45·0	45·7	45·1	95	10	·06	S.W.
29	29·59	56·9	45·2	53·7	51·2	83	10	·08	S.
30	30·30	55·1	45·3	53·9	49·5	72	10	trace	S.W.
31	30·12	54·2	36·3	50·5	46·1	71	10	·45	S.W.
Mean	29·67	57·5	46·4	53·6	51·4	86	9·5	Total 7·78	
Mean for 21 years	29·90	56·3	41·2	49·5	47·6	87	7·3	8·13	

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NOVEMBER.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·99	53·9	47·1	48·1	47·4	94	10		N.W.
2	30·14	54·1	37·4	48·4	48·0	97	10	·26	S.
3	·26	53·1	48·1	51·1	48·8	84	8		N.E.
4	·32	52·2	30·1	43·1	42·9	98	3		N.E.
5	·61	51·1	32·1	43·7	43·1	95	8		N.E.
6	·52	53·9	38·2	50·4	47·2	78	10		N.E.
7	·47	48·7	28·7	45·1	45·1	100	10		N.E.
8	30·26	51·9	30·8	45·1	43·4	88	10	·07	S.W.
9	29·99	55·1	36·7	52·2	51·8	97	10		S.W.
10	30·15	53·9	38·7	50·9	48·7	85	10		S.
11	·33	52·9	50·0	52·3	51·0	91	10		S.E.
12	·28	53·1	44·2	48·2	47·4	94	10	trace	S.E.
13	30·18	53·2	47·7	52·4	49·8	82	10	·08	S.W.
14	29·75	56·1	48·1	51·7	51·3	97	10	·02	S.W.
15	·70	49·5	35·8	39·2	38·1	91	7		W.
16	·79	44·2	29·5	36·3	35·3	91	5	trace	N.W.
17	29·85	42·4	33·3	41·1	38·1	77	10	·05	N.W.
18	30·11	44·4	35·1	41·2	37·9	75	10	trace	N.W.
19	·20	44·1	27·8	38·2	37·7	95	10	trace	N.W.
20	30·06	50·7	26·7	37·2	36·6	94	10	trace	N.W.
21	29·80	53·9	37·2	49·4	46·1	78	10	·02	N.E.
22	30·14	53·1	41·6	45·2	42·9	83	5	trace	W.
23	·22	53·1	44·7	48·9	47·8	92	10	·10	S.W.
24	·18	47·1	43·4	44·4	43·5	93	10		N.W.
25	·22	47·1	30·1	42·5	39·7	78	2	trace	N.W.
26	·11	49·7	37·5	42·9	39·7	76	5	·02	N.E.
27	30·22	50·1	39·2	49·2	48·5	95	10	·82	W.
28	29·13	44·7	41·5	42·9	42·1	94	10	·29	N.W.
29	·23	39·4	36·7	37·9	36·5	87	10	·01	N.E.
30	29·29	36·1	29·6	33·3	32·3	89	10		N.
Mean	30·05	49·8	37·6	45·1	43·6	89	8·8	Total 1·74	
Mean for 21 years	29·96	49·6	37·4	43·7	42·6	92	8·1	2·56	

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DECEMBER.

Date	Barom. Reduced.	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In	°	°	°	°	%	0—10	In.	
1	29·47	36·4	27·9	33·7	32·0	82	10		N.E.
2	·93	40·9	24·5	32·2	30·8	82	8		N.E.
3	·93	45·2	23·7	40·1	37·1	76	8	·25	S.
4	·42	45·9	39·7	42·9	42·2	94	10	trace	S.W.
5	·19	31·9	24·5	27·9	27·6	94	10		N.E.
6	·44	40·6	26·4	30·7	30·3	93	10	·03	N.
7	·31	46·9	25·1	40·2	39·7	96	10	·21	S.
8	·30	50·1	36·3	45·5	43·1	82	10	·25	S.
9	·17	51·9	42·2	49·9	49·8	99	10	·50	S.
10	·11	45·9	39·4	44·7	44·1	95	10	·61	S.
11	·35	47·1	39·0	42·1	40·5	87	10	·03	S.W.
12	·46	45·4	32·6	40·4	40·1	97	10	·48	S.W.
13	·24	46·5	39·9	45·5	43·7	87	10	·18	S.
14	·61	48·4	36·5	39·1	37·6	87	5	trace	S.E.
15	·70	44·1	37·5	42·7	41·7	92	10		S.E.
16	·59	42·1	36·8	39·7	38·1	79	10		S.
17	·77	44·1	37·2	40·4	40·2	98	10	trace	S.
18	·77	42·1	38·7	40·9	40·9	100	10	·01	S.E.
19	·90	41·3	39·5	40·7	39·4	89	10	trace	S.E.
20	29·99	40·1	35·8	36·4	31·0	58	10	trace	S.E.
21	30·23	48·9	35·5	38·9	38·9	100	10		S.E.
22	·21	48·7	38·5	48·1	47·2	93	10		S.
23	30·02	43·1	41·4	42·5	41·7	94	10		S.
24	29·88	40·9	35·5	40·1	40·1	100	10		N.E.
25	30·00	40·1	35·3	36·7	36·3	96	10		N.W.
26	29·94	38·7	35·1	36·9	36·0	92	10		N.
27	30·04	36·3	26·6	35·6	33·8	84	10	·01	S.E.
28	30·10	34·6	32·8	34·5	34·4	99	10	trace	N.
29	29·98	31·9	28·4	31·2	29·6	78	10		S.E.
30	30·02	33·1	25·4	26·7	26·4	94	8		E.
31	29·75	30·9	23·7	28·1	23·1	32	10		E.
Mean	29·70	42·1	33·6	38·5	37·3	88	9·6	Total 2·56	
Mean for 21 years	29·91	44·1	32·9	38·5	37·6	91	8·1	2·36	

Total rainfall for the year, 39·59 in.

Mean for 21 years, 25·14 in.

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FIELD CLUB SECTION.

In point of numbers of members the Field Club may be regarded as being quite as successful, and in some other ways even more successful than it has been hitherto. The interest taken in keeping note books and making them true records of observations shows that the Field Club is doing some very useful work, and it is to be hoped that this will be the case in the future. The value of this work if it is carried on for some years will become more apparent in later years, when the habit of observing and still more of *faithfully* noting down facts however small and drawing logical conclusions therefrom will be found to be of extreme importance and usefulness in all professions and in whatever one may be doing.

Some of the note books were really excellent, some were too much of a mere record of captures, which is useful for some purposes but cannot be considered to be of any value from the point of view of observation in nature study.

By all means keep lists of captures, with dates and localities carefully and correctly noted; these will be of great value in obtaining a good knowledge of the Flora and Fauna of the neighbourhood; and they will be of interest when some other neighbourhood is explored with different surroundings and conditions; soil, climate, dry or wet seasons and so on, for all these factors will have to be taken in account.

Four special subjects were posted early in the season, and it was hoped that some members of the Field Club would select one or two of these and endeavour to work them up thoroughly. Very few competed, which is a matter of regret, perhaps next year more work will be done on the subjects proposed. They were as follows:

1. Seed dispersal.
   (1) By wind. (2) By animals. (3) By special devices. Observations and collections required.

2. The life history of any one particular kind of insect; egg, nest structure, habits and general history of the wasp family.

3. Photographs and sketches of birds' nests, with notes on their structure and position; colour or absence of colour in the eggs, pointing to concealment or protection, etc.

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4. The gravels of the district:

(1) Materials, illustrated by a collection.

(2) Arrangement and distribution.

(3) Their origin.

Due notice will be given of the subjects proposed for 1904.

The past season, owing to the abundance of rain throughout the year, has been a disastrous one in many respects; it would seem to have done great damage to insect life in general, and from reports received, migratory birds suffered very much; the great gales about the times of migration caused the destruction of many thousands. Swallows were very few in number in most places. The chief interest was the reappearance of the Smooth Snake (Coronella austriaca or C. Lævis). One specimen was captured on the far side of Cox's Wood, and rumour says that another one was also seen on a different occasion but that its escape was due to the fright of the finders. The specimen that was caught however was safely housed and watched for some weeks, its habitation being in Mr. Blundell's room, it being allowed a free run every now and then in the garden. when several very successful photographs were obtained of it. It spent the summer holidays, I believe, in Ireland, and succeeded in making its escape. A second specimen was captured in September, and is now in the Museum. Dr. Leighton, in "British Serpents," quotes a letter from Mr. J. L. Bevir, which states as follows: "In the course of two years I had five specimens of the harmless smooth-crowned snake (C. Lævis) but that is nearly twenty years ago. I think it is extinct in these parts nowadays." There is a record, however, of one having been caught in 1893, the same year in which our greatest rarity in plant life was also first recorded (Illecebrum Verticillatum) and by the same person, Mr. A. W. S. Fisher, of Oxford.

Three excursions were held, all of which were well patronised; the one which was fixed for July 18th to Hook Common had to be abandoned at the last moment owing to drenching rain; in the other three we were fortunate in having fine days, but owing to the bad season, none of them can be looked upon as having been successful from the list of captures that were sent in afterwards; at any rate everyone enjoyed the outings and seemed in all other respects well satisfied.

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On March 29th a meeting was held in the Museum, when the following Committee was elected for 1903.

Director	Rev. H. P. FitzGerald.
Entomological Secretary	A. W. M. Jesson.
Geological Secretary	W. A. S. Rough.
General Secretary	J. R. L. Heyland.

The keeping of note books was made compulsory for members.

EXCURSIONS.

SATURDAY, MAY 16TH.

An excursion was made to Shalford; the party, 48 in number, left by the 12.20 train, and on arrival, lunched in Col. Godwin Austin's inclosed chalk pit (by permission) and then dispersed, meeting again for tea at the Sea Horse Inn at 5 p.m., returning by the 6.11 train to Wellington College.

The day was rather showery and somewhat cold, but on the whole quite satisfactory. Many birds' nests were found but nothing of very special interest. The botanists found very little, owing to the lateness of the season. Several specimens of the big Edible Snail (Helix pomatia) were found; this seems to extend for some way along the chalk downs, certainly as far as Gomshall, where it has been found in previous years.

The geologists explored the various chalk pits, leave having been given by Col. Godwin Austin and Mr. Williamson, the owners; fossils were rather scarce and no very good specimens were found.

SATURDAY, JUNE 6TH.

A party of 30 went to Goring with Mr. Lemmey, and first of all lunched at the Church House, by kind permission of the Rev. L. Wallace, the Vicar, and then dispersed, meeting again for tea at Capt. Towse's house, who had once more given a general invitation. The entomological secretary sent in the following report:—"The weather was not very promising in the early morning, but it cleared up in the afternoon, and the sun came out, but there was a cold east wind blowing which was extremely unfortunate for the entomologists. The captures on the whole were not very good, partly perhaps on account of the wind and partly on account of its being rather early in the

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season. The best finds were several Green Hairstreaks, Treble Bars, and a few Mother Shiptons; Orange Tips, Skippers, Yellow Shells and common Blues and Whites were in abundance; a few Carpets were also taken from the yew trees. There was a marked absence of Silver Studded Blues and Marbled Whites for which Goring is so noted. The best places to look for insects in were the sheltered spots in the corners of the big hay fields, and much good and successful work might have been done in the woods if time had not been so limited. No Ova, Larvæ or Pupæ were found at all."

Alexander, the one botanist of the expedition, was very much more fortunate, his two best finds being Henbane (Hyoscyamus niger) and the Caper Spurge (Euphorbia Lathyris), the latter being extremely rare; it is recorded in Druce's "Berkshire Flora" as having been found at Streatley, but probably not indigenous.

Saturday, July 4th.

A small party, 16 in number, went to Ash by train, and thence to Puttenham Common by brake; a few geologists having started off early on bicycles for the same neighbourhood. After lunching on Puttenham Common we went our various ways, meeting the geologists at tea time at the Golden Fleece Hotel.

The entomological secretary writes as follows:—"A better day for the entomologists could not well have been wished for, as it was a beautiful warm, sunny day with a slight wind blowing. Puttenham ought to be an excellent place for butterflies as there are the river and two lakes as well as some swampy ground and also some very good oak woods, but on this occasion the captures were exceedingly disappointing, no one obtaining anything of value at all. Amongst the few specimens taken were a few Bedford Blues and several Belles, also some small Heath butterflies and Meadow Browns. One male Clouded Buff was caught, but many more ought to have been found in the heather. I also expected to see Bedford Blues in abundance on the banks of the river; it is impossible to account for the scarcity of specimens unless it is that the rains at the beginning of term drowned all the pupæ."

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The botanists found a good variety of plants, including several fairly good ones but nothing of particular note.

The place has every appearance of being a most excellent hunting ground for all purposes, and it has the advantage of having the river, in which it is possible to refresh oneself with a swim ; it will be quite worth while to go there another time before giving it up as a hopeless place ; there are so many natural advantages that one can scarcely believe it to be so bad as reported in an ordinary year.

SATURDAY, JULY 18TH.

An excursion to Hook Common was planned, but there was such heavy rain that it was abandoned.

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GEOLOGICAL REPORT.

This branch of the Field Club is usually less affected by the weather than the others, indeed on the excursions one often hears the budding geologist criticising a section because it wants more weathering. This year, when to explore a clay pit led to serious doubts as to whether one would not be imbedded oneself, the process was hardly appreciated. However, the remarkable rainfall led to a series of observers independently discovering a periodic spring on Big Side—until the college workmen repaired the pipes.

The Bracknell London clay pits were visited during February and March by several small parties who obtained a large number of specimens from the nodules, but these included no species not found in previous years. A number of Cyprina and Gervillea were found in the corresponding beds near Wokingham station.

On May 15, the chalk pits at Shalford and Guildford were visited.

On June 6, eighteen of us cycled over to Farnborough to join the excursion of the Geological Association who had kindly invited us. We were shown some good sections in the Upper Bagshots, but the main feature of the expedition was the remarkable series of Sarsen stones in the gravels in situ discovered and shown us by Mr. Monckton. The most striking were in the pits at Chobham ridges where several were photographed by members. Time hardly allowed us to make a satisfactory search for fossils in the Bagshot of Tunnel Hill.

On July 4, we cycled through Tongham to the Hog's Back, explored a few of the chalk pits on the ridge and rode along it to Compton. Here we spent some time at a fossiliferous band in the Lower Greensand near the church, a large number of specimens being found. Cole was particularly successful with sharks' teeth, but these like the Rhynconella and Ammonites were waterworn and probably derived from another bed. We then visited the Atherfield clay exposure at Littleton, where we found a fair number of specimens, and subsequently joined the rest of the Field Club at Puttenham.

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Generally speaking, I may point out that the peculiar position Geology occupies as a field work subject taught in a class room with the consequent advantages and disadvantages was brought out this year more clearly than usual. With regard to the latter, the class-room knowledge with its breadth of view is, except by a few, flung to the winds in a quarry in the search for a fossil, while examples seen during field work are seldom used in the class-room. If the two parts were regarded more in the light of description and illustration each member would get more from the subject, whether he were in search of examination marks or interest.

G. E. BLUNDELL.

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PHOTOGRAPHIC SECTION.

1903.

RECEIPTS.

	£	s.	d.
Balance from December 31st, 1902 ...	6	19	10
Lent Term - Subscriptions		3	0
Midsummer Term—Subscriptions ...		13	0
Entrance Fees		16	0
Michaelmas Term—Subscriptions ...		8	0
Entrance Fees		15	0
	£9	14	10

EXPENDITURE.

	£	s.	d.
Lent Term—Glass for last Term ...		5	0
Cleaning „ ...		5	0
Midsummer Term—Glass „ ...		5	0
Cleaning „ ...		5	0
Michaelmas Term—Glass for Midsummer and Michaelmas Term		10	0
Cleaning do. ...		10	0
Knight for Hypo. Midsummer Term ...		5	0
Balance, December 31st, 1903	7	9	10
	£9	14	10

P. H. KEMPTHORNE.

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THIRTY-FIFTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1904.

VIRTUTIS FORTUNA COMES

HEROUM FILII

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."
Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1905.

WISCONSIN ACADEMY
OF
SCIENCES, ARTS, AND LETTERS

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THE WELLINGTON COLLEGE PRESS:
PRINTED BY THOMAS HUNT.

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Contents.

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RULES.

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1. That this Society be called the "WELLINGTON COLLEGE NATURAL SCIENCE SOCIETY."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That all Members of the School be eligible as Associates, and that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names, with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the numbers of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other Benefactors.

18. That Members pay a subscription of 1s. 6d., and Associates of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last Meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all Meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read Papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That Meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, a Field Club Section and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

PRESIDENT—S. A. SAUNDER, Esq.

VICE-PRESIDENTS { J. L. BEVIR, Esq., H. W. OWEN HAGREEN, Esq., REV H. P. FITZGERALD, G. E. BLUNDELL, Esq.

SECRETARY { R. G. DAINTY, A. S. G. KENNARD

TREASURER { H. KNOX SHAW, F. H. HULEATT

DIRECTOR OF THE PHOTOGRAPHIC SECTION—G. E. BLUNDELL, Esq.

SECRETARY OF THE PHOTOGRAPHIC SECTION—T. HARE

DIRECTOR OF THE FIELD CLUB SECTION—REV. H. P. FITZGERALD

SECRETARIES—For ENTOMOLOGY, G. JEFFREYS.

For BOTANY—L. D. G. ALEXANDER.

GENERAL SECRETARY—J. P. G. WORLLEDGE.

DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, Esq.

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H. W. EVE, Esq.
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A. S. TOMLINSON, Esq.
E. A. DOWNES, Esq.
REV. H. GRAY
W. H. WRIGHT, Esq.
W. H. KENNETT, Esq.

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Those Members and Associates whose names are marked *p* are members also of the Photographic Section. Those marked *f* are members of the Field Club Section.

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R. G. DAINTY†
J. C. ARMSTRONG
A. E. WATKIN
f H. P. R. FOSTER
fp J. P. G. WORLLEDGE
f L. B. IRWIN‡
f L. LAWRENCE SMITH
f J. H. CURELL‡
fp F. H. HULEATT
p T. HARE†
fp H. F. NORTH
fp E. F. A. HAY
fp J. H. HAY
A. S. G. KENNARD‡

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f H. V. WHITE
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f C. SYKES BANKS
W. de GEIJER
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f D. WYNYARD
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fp L. ERRINGTON
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f C. K. WIGRAM
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p J. B. BOLITHO
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V. A. BEAUFORT
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E. C. WHITELEY
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P. HELYAR
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N. R. DANIELL
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C. W. HOOPER
J. E. M. MELLOR
G. D. G. ELTON
M. A. CAPRON
R. B. HARWARD
D. J. LEACOCK
p H. P. A. HAGREEN
D. B. MACKINTOSH
J. O. DAVIS
L. RUMSEY
N. S. COLLIER JOHNSTON

* Left Lent Term, 1904. † Left Easter Term, 1904. ‡ Left Christmas Term, 1904.

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List of the Societies and Journals to whom Copies of the Report are sent.

—:o:—

*Cheltenham College N.H.S.

Clifton College N.H.S.

*Dulwich College N.H.S.

*East Kent N.H.S.

*Epsom College N.H.S.

*Felsted School N.H.S.

*Haileybury College N.H.S.

*Harrow School Scientific Society.

King Edward's School, Birmingham, N.H.S.

Malvern College N.H.S.

*Marlborough College N.H.S.

*Rugby School N.H.S.

*Uppingham School N.S.S.

Winchester College N.H.S.

British Museum (Natural History).

Geological Survey Office.

Linnean Society.

*Royal Meteorological Society.

*U.S. Geological Survey Office.

*Chicago Academy of Sciences.

*El Instituo Geologico de Mexico.

*University of Montana.

*Wisconin Academy of Sciences, Arts and Letters.

Nature.

Science Gossip.

* Those marked with an asterisk exchange Reports with us.

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ACCOUNTS.

RECEIPTS.

	£	s.	d.
Balance in hand	103	10	1
Subscriptions:			
Lent Term—Honorary Members ...	4	5	6
Members & Associates	5	3	0
Easter Term—Honorary Members ..		9	0
Members & Associates	7	14	6
Michaelmas Term—Honorary Members		7	6
Members & Associates	5	17	0
Bursar, for use of Lantern, Gas, &c. ...	1	10	0
Sale of Report	5	3	4
Interest on Deposit	2	5	6
	£136	5	5

EXPENDITURE.

	£	s.	d.
Gas and Limes for Lectures	2	9	2
Stamps	1	11	0
Carriage of Parcels	1	0	7
Hire and Purchase of Slides	3	5	2
Hook for reading Thermometers ...	2	0	0
Watts for preparing Lecture room ...		15	0
Cutting grass round Meteorological Instruments		1	0
Prizes	2	10	0
Hunt for printing Report	11	18	0
Printing and Stationery	1	1	9
Baker for enlarging Lantern	5	15	0
Part of repairs to Dark Room	2	4	10
Balance in hand	101	13	11
	£136	5	5

Examined and found correct,

December 19th, 1904. S. A. SAUNDER.

F. H. HULEATT, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 13th.

W. P. Watmough, Esq., gave a demonstration of "Intensification, Reduction and Toning of Photographs."

The lecturer said he did not intend to describe the ordinary A B C of photography, which he anticipated all his hearers knew, but he wished to explain the use and great advantage of 'Tabloid' photographic chemicals.

Each of these, as a rule, contains one or more definite chemicals; for instance, in 'Tabloid' pyrogallic acid there are two grains of that chemical, which is a very large quantity for the size of the tabloid.

The lecturer then proceeded to tone two or three black and white bromide prints by using 'Tabloid' copper ferro-cyanide toning compound. Since his prints were whole plate size, he mixed three tabloids with three ounces of water, but explained that for the popular quarter-plate one tabloid would do the work equally well. After the prints had been put in the dish the solution began to tell immediately, and within the space of a few minutes the black and white turned into a rich sepia, giving a most artistic effect. This process is particularly useful when the negative is faulty and produces a black and ineffective tone. It made absolutely no difference, he said, whether it was a print or a lantern slide, and he showed the truth of his statement by adding one more tabloid and giving a very picturesque slide the same warm tone. The lecturer finished his explanation of the uses of the copper ferro-cyanide by toning two prints made on gas-light paper. This produced a slightly different result, giving a much redder tone than the bromide. Two really bad, under-exposed negatives were handed round for inspection, and the lecturer said it was his intention to show how these could be rectified, or at least, greatly improved. He resorted to 'Tabloid' iodide of mercury and sodium sulphite to accomplish this. These should be very carefully handled for they are extremely poisonous.

The negative was then cut in half, one half being put in a solution of one 'Tabloid' intensifier in an ounce of water while the other was left for comparison. The half which was

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in the solution immediately turned yellow and became much denser; it was then transferred into a 'Tabloid' metol developer, though any developer would serve the purpose. The developer is mixed in precisely the same way as if the photographer were going to develop an ordinary negative but in this case no dark room is needed. The result was really marvellous. The thin under-exposed plate was now a quite dense and perfectly printable negative and the difference was especially visible when compared with the half which had not been treated in the solution. For reducing an over-exposed and too dense negative the following method is a very satisfactory one. Take one 'Tabloid' hypo and dissolve in one oz. of water, add one 'Tabloid' ferricyanide, the solution is now ready for use. Another method, take one oz. of hypo (crystals) to ten oz. water, for use take one oz. of this and dissolve in it one 'Tabloid' potassium ferricyanide. The exact strength of hypo is not very important, but it must on no account be acid, or contain anything but plain hypo. This will give just as good a result in reduction as the previous method did in intensification. This process works equally well on lantern slides and films as on plates.

The lecturer went on to show the use of 'Tabloid' metol quinol as the developer of gaslight bromide prints. It is a very quick and easy process, the mixture consisting of two tabloids to two oz. water. After a very few minutes a black and white print resulted.

Perhaps one of the most useful things to be learnt by the amateur photographer is the advantage to be gained by using potassium percarbonate. Potassium percarbonate is used to eliminate the hypo from negatives and prints which cannot be properly washed owing to shortness of time or water. In fact it practically turns hypo-sulphite into harmless sulphate and saves fully an hour's washing.

Mr. Watmough concluded a most instructive lecture by showing some slides in the lantern amongst which were some on which he had just been experimenting.

A vote of thanks to the lecturer was proposed by Mr. Perkins.

Saturday, February 27th.

H. Hart, Esq., gave a lecture on "India," in which he continued an account of a part of his travels he had given a year before.

The lecturer began by saying that last time he dealt with the country between the Khyber Pass and Agra, but now intended to proceed from Benares southwards. He showed a picture of Benares, near the burning Ghat, and described

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how very idolatrous that city was, Benares being one of the chief Hindu sacred cities. He also showed a picture of a fakir or holy man who sits on a couch covered with nails, points up, in one of the chief streets of the city, and who is delighted if he can get as much as four annas for his trouble. From there he proceeded to Jubbulpore, which is famous for its marble rocks, and which is the visiting place of vast swarms of bees alluded to in Kipling's story in the Jungle Book in which he speaks of the "Little People."

Mr. Hart said that the railway they travelled by was terribly slow, in some places slower than the fine carriages he was lent to drive about in. In the Nizam's territory he showed some caves, some of them of immense size, which had been made in the rock many centuries ago, probably because of the religious persecutions of the inhabitants. There was a very good photograph of a Buddhist temple which had been chipped out of the rock. The carving and workmanship were marvellous and spoke well for Hindu ingenuity.

At Dowlutabad there is a splendid natural fortress, which, seen in the distance, looked more like a pyramid; it is impregnable. Further on in his journey through the Nizam's territory the lecturer met a wedding procession at a place called Aurungabad, and felt, he said, very much ashamed at photographing the bridal party.

The wall of Seringapatam by the river Cauveri, which was attacked by Sir David Baird's men in 1799, was also shewn. At the Government house, Mysore, Mr. and Mrs. Hart were very hospitably entertained. They were taken to Tippoo Sahib's palace, which from the outside, is an ordinary looking building with curtains, for windows, but the inside view shewed some excellent carving and frescoes, one of which represented the defeat of Colonel Baillie by Hyder Ali at Pollilore. The Duke of Wellington lived here for two years, when he commanded the district.

At Madura the sacred elephants and the temple of Minakshi are the chief features, the former being able to pick up a coin the size of a threepenny bit with their trunks. The last two places visited before leaving India for Ceylon, were Trichinopoly where Clive's house is to be seen, and Belgaum, where the lecturer determined to get a photograph of some buffaloes, and did so, for a picture was shewn of three of these ungainly animals. There is a strange legend about these buffaloes among the inhabitants, which says that when the earth was created and God had finished making all the different animals, he told Adam that he might try and make one, whereupon Adam set to work, and the best animal he could produce was a buffalo.

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On leaving India Mr. Hart visited Ceylon, and went over the Boer camp at Diyatalawa. This was composed of corrugated iron huts each of which was capable of holding forty-eight Boers; these were surrounded by a thick barbed-wire entanglement, which would be very difficult, almost impossible, to get through or over.

Precautions had to be taken against the escape of the Boers, and also against a possible attempt at their rescue by the numerous Dutch inhabitants of Ceylon. To guard against this, the camp was surrounded by a chain of electric-lights, but as the electricity was constantly failing, this precaution was somewhat ineffective. There were sentries at intervals round the camp, but there was no very keen desire among the Boers to escape, all of them being well treated, and most of them quite happy. A sergeant of the Cornwall Light Infantry who took the lecturer round the camp said that the Irishmen among the Boer prisoners were the most unruly, and the most ready to make a disturbance. Some of the Boers there were quite young, there being one little boy there of twelve years old. Pictures were shewn of the prisoners playing marbles, and sitting about inside or outside their huts, looking for the most part quite contented.

At Colombo the lecturer had photographed some Catamarans, long native boats with large outriggers, and also some small floats made of three or four logs of wood lashed together and each manned by a little boy-diver, who calls out Pāpa Pāpa, di, di, (dive, dive), and who will dive for a small coin thrown into the water. This is forbidden in Aden, (although it is done there sometimes) because of the sharks which abound in the harbour. A photograph was shewn of the "Ophir" at Suez with the Duke and Duchess of York on board.

Shark-fishing is an excellent sport, but it involves very hard work to land a large shark, as Mr. Hart experienced one day when he went shark-fishing. The method is simple. A piece of meat is placed on a large hook tied to a stout line, and thrown into the sea over the ship's side, and immediately several sharks make a dash for it, but always preceded by a thin narrow fish known as the "pilot." No sailor will eat shark, except some native stokers known as Sidi boys, who relish it.

The last picture was the lecturer's faithful and devoted servant, John Lawrence de Souza, who did everything for them on their tour, and whom the lecturer thoroughly recommended to anyone intending to make a tour through India, should it still be possible to find him.

A vote of thanks to the lecturer was proposed by Mr. Davenport.

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Saturday, March 12th.

A. R. Hinks, Esq., F.R.A.S., gave a lecture on "Star Photographs."

The lecturer began by pointing out what a great boon photography is to the astronomer. Owing to the unsteadiness of the English atmosphere there are very few nights in the year on which anything but a blurred and indistinct image can be obtained through a telescope. Photography enables the astronomer to make the most of these evenings and to take pictures which he can study afterwards at his leisure. Another great advantage is that anyone can obtain photographs taken with the very best telescopes in the world.

The best telescopes are naturally in America. Mr. Hinks told the story how a Mr. Lick, wishing to immortalize himself, determined to have made two gigantic statues, one of himself and the other of his wife, but was persuaded to build instead an observatory on Mount Hamilton in California, which observatory bears his name. He could not, however, vouch for the absolute accuracy of this account, as he had been told on good authority that Mr. Lick was never married.

Afterwards the Yerkes observatory was built and this observatory now possesses the finest visual telescope in the world. Lately, Mr. Ritchey has by a very simple device taken with it the finest astronomical photographs that have ever been produced. These photographs have done much to further the enquiry into the nature of star clusters. The lecturer shewed several photographs of star clusters, the principal ones being those in Antinous, Hercules and Pegasus. Nobody yet knows what these star clusters are, how far they are off, or what their real dimensions may be; but at the lowest estimate they must be enormous compared with distances of which we can form any conception.

Mr. Hinks then turned to the problem of Nebulæ and showed photographs of the Pleiades taken with a small telescope, and then some taken with the Yerkes telescope. He especially called attention to a series of straight streaks that ran through the Nebulæ, and which were probably of a gaseous nature. He next showed a slide of the Nebula in Orion, which is the middle star of his sword. What these Nebulæ consist of is uncertain, but hydrogen and helium form a part, and to give an idea of their size, it was stated that the Nebula in Orion receives 200,000 times as much heat from our sun as the earth receives. The only way anything can be learnt about these Nebulæ is by their motion, and since they move very slowly it will be hundreds of years before any difference can be noted. Mr. Hinks then showed

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several drawings of Nebulæ, the best representations of them possible before photography came to the astronomers' aid. He also exhibited photographs of Nebulæ in Cygnus, Andromeda and Perseus. Some of them were of the spiral form; in fact, as the lecturer told us, 95 per cent. of Nebulæ are spirals.

The lecturer then pointed out the duty that falls on the astronomers of to-day—that of recording knowledge, as well as taking photographs which the astronomers of the future may compare with those of their own time. Many astronomers are devoting their lives to measuring photographs taken by the best telescopes in the world. Mr. Hinks showed several photographs of the moon taken with the Yerkes telescope, one of the crater Copernicus being especially beautiful. In conclusion he said that there was yet much work to be done in measuring photographs and that it was a work he could advise anyone who had leisure hours to try, as it did not entail the expense of a telescope.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, March 26th.

H. W. O. HAGREEN, ESQ., gave a lecture on "Great Pictures, Old and New."

There is a very natural tendency to assume that pictures by the "Old Masters" are ugly, dull, and unintelligible. Often they seem ugly and dull just because no attempt is made to understand them, to look a little behind the paint, to find out the spirit of the painters and of their times; to see what was in their minds as they painted, what were their ambitions, their limitations, their difficulties. There is no need to assume that a picture is either good or bad, simply because it is old; but careful examination will often enable us to greatly modify the opinion formed at a first glance, and to find in an old picture not merely artistic qualities at first unsuspected, but more information about the habits, the appearance, the implements, the dwellings, even the thoughts of the folk amongst whom it was painted, than could be conveyed by pages and pages of written description.

Each generation starts, so far as knowledge and accomplishment are concerned, where the previous generation left off, so that for instance, the magnificent attainments of the painters of the Sixteenth Century were only possible through the struggles of their predecessors. And it by no means follows that the finest painting, considered merely as painting, is the result of the noblest thought or the most lofty ambition. On the contrary, so long as the means of expression are felt to be unequal to the intention, the painter's energies are likely to

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be devoted to high ideals; but when execution has become easy, then he is apt to seek to be effective rather than true, to choose subjects as vehicles for paint, rather than to use paint as a vehicle of thought.

Browning puts these words into the mouth of Andrea del Sarto, "the faultless painter."

"I do what many dream of all their lives
"Dream? Strive to do and agonise to do,
"And fail in doing......
"Who strive—you don't know how the others strive
"Yet do much less, so much less......
"There burns a truer light of God in them,
"In their vexed beating, stuffed and stopped up brain,
"Heart, or whate'er else, than goes on to prompt
"This low-pulsed forthright craftsman's hand of mine.
"Their works drop groundward, but themselves, I know,
"Reach many a time a heaven that's shut to me."

Starting with del Sarto's portrait of himself in the National Gallery, the history of Italian art was illustrated by a series of lantern slides and prints from pictures, going back to the decoration of the Roman Catacombs. Then a slight account of the method of fresco painting laid stress on the difficulty of such work, and the boldness and decision needful for its successful execution. Lastly a few examples of the early Flemish and German schools were shown, with special reference to the perfecting of the method of painting in oils by the brothers Van Eyck.

A vote of thanks to the lecturer was proposed by Mr. North.

Saturday, April 9th.

J. A. HARDCASTLE, Esq., F.R.A.S., gave a lecture on "The Sun."

The lecturer commenced by saying that he preferred to lecture on the Sun rather than on any other subject, as astronomers knew very little about the Sun. Indeed the facts known about the Sun can be counted on one's fingers. He said that the Sun was divided into five parts, the nucleus or centre which we can never see, the surface or photosphere which we see whenever we look at the Sun, the chromosphere which can be seen with the help of a powerful spectroscope, the corona which can only be seen during a total eclipse of the Sun, and lastly, the zodiacal light which is sometimes visible after sunset. Mr. Hardcastle showed some photographs of the four of these parts which are visible. In a photograph of the photosphere some Sun-spots appeared; in another taken a few days later these had moved, showing that the Sun rotates.

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A reproduction of the first photograph taken of an eclipse was shewn. It proved conclusively that the chromosphere was part of the Sun, and not part of the Moon as some astronomers had suggested.

Mr. Hardcastle then proceeded to treat the several parts in greater detail. He could not say anything about the nucleus or centre of the Sun, as nothing was known about it. He accordingly began with the photosphere. The points of greatest interest on the photosphere are the sun-spots. They are ever changing and vary immensely in number. Sometimes for a short period none are visible; they last for any length of time, from a few hours to a few months. What they are is not known, but they certainly look like holes, and many people think they are depressions in the surface of the Sun. Several beautiful drawings of famous sun-spots were shewn, but the lecturer said that such minute details could never be obtained in a photograph, owing to the unsteadiness of our atmosphere which prevented the image in the telescope from keeping still for more than a few seconds at a time. As he was saying this, the image on the screen began to jump about, showing us what a sun-spot usually looks like through a telescope. The black portions of a sun-spot are only black in contrast to the brilliant light around them; even a glowing limelight such as is used in a lantern looks black if held up against the sun.

The lecturer then showed some drawings and photographs of the chromosphere. A way has been discovered of taking photographs of the chromosphere by means of the spectroscope at times when the Sun is not eclipsed. The prominences are of two kinds, quiet and eruptive; the latter are known to be composed of metallic vapours. The quiet prominences remain still for quite a long time, but the eruptive ones are sometimes seen to blow up with terrific velocities, often as great as one hundred miles a second.

He next exhibited pictures of the corona which is considered by those who have had the good fortune to witness a total solar eclipse to be the most beautiful part of the Sun. It consists of a faint pearly light which sometimes assumes the form of short tufts or plumes at the poles, and longer streamers at the equator of the Sun. It has been noticed that the corona is most active when the number of sun-spots is greatest. What the corona is, is not exactly known, but it must be composed of a very rarefied gas.

Mr. Hardcastle then showed a few miscellaneous slides. The first was a photograph of the Sun taken in calcium light, all the other rays of light being excluded from the camera by means of the spectroscope; then some diagrams showing how

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the equatorial parts of the Sun rotate faster than the poles; and concluded by showing another diagram illustrating the relation between the excursions of a magnetic needle and the numbers of sun-spots.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, May 28th.

The REV. T. LEMMEY gave a lecture on "Pond Life."

The lecturer began by pointing out that the inhabitants of ponds are so numerous, and comprise so many different orders and species, that it would be impossible to do more than give a general idea of them.

The life of an insect is one of constant change, not of its surroundings, but of its own form. The earliest form is that of the egg, from which the larva is hatched in due time; the larva immediately enters upon a series of changes, in the course of which he sheds his skin several times, and eventually becomes a chrysalis, pupa or nymph. Usually the last change produces an insect so unlike its larval form, that they seem to have hardly a single feature in common. As these creatures require their blood to be re-oxygenated as much as we do ourselves, a variety of wonderful methods have been employed to enable them to breathe air when under water. The peculiar breathing arrangements of the larvae of the two varieties of the dragon-fly were first explained. The larva of the demoiselle dragon-fly is provided at the tail with three leaf-like appendages, furnished with tracheal tubes and branches, while in the case of the larvae of the larger dragon-flies, the apparatus for extracting the air is inside them; they draw the water in at the tail, and eject it again so forcibly, that the recoil sends them rapidly through the water. Dragon-flies do not alter much during their earlier stages. The traces of wings soon appear, even after the first moult or two. When a moult is about to take place, the creature fixes its claws into some support to obtain leverage, and then, by strong muscular effort, the back of the thorax is split, and the insect crawls out of its case. After the final moult, the newly-emerged insect is in a most helpless condition; it is soft all over, its wings are small and crumpled, and it can do nothing but wait for the air and sun to complete its development. The eyes of the perfect insect cover a large proportion of the head. The eyes are compound, and are spread over such a large convex surface, that the insect has a wonderful range of vision. The wings are furnished with very powerful muscles.

The next object shown upon the screen was the larval form of a large water-beetle, the Dytiscus Marginalis. This larva

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has an enormous mouth, which it cannot open because the upper jaw laps over and hooks into the lower. To enable it to feed, therefore, each of its mandibles is pierced with a fine canal, running down the greater part of its length. The creature forces the tips of its mandibles into its victim, whose juices it then proceeds to suck out through the canals. The mouth organs, the fore-feet, and the spiracles of the Dytiscus were then exhibited. The spiracles or breathing apertures are principally situated in the back, which is flat, while the Elytra, or hard wing cases, are somewhat arched, but fit closely to the body at the outer edges, except at the extreme apex; a hollow chamber is thus formed over the spiracles, which can be filled with air, but to which the water has no access.

The larvae of the Gyrinidae, or "Whirligig" beetles, are curious creatures, looking something like aquatic centipedes, for besides six legs, they have a series of filaments projecting from their sides, by means of which they breathe. The most interesting point in this beetle is the arrangement of its eyes. The upper half of each eye is set high upon the head, and the lower half lower down, the space between, which is on a level with the water surface, being covered with a horny plate, and forming a base for the antennae. The armoured body of this beetle is so round, hard and highly polished, that it is exceedingly difficult to hold, and in addition, when seized, it emits a horrible odour.

The life-history of the gnat was next passed in review. In order that the larvae hatched from the eggs may find themselves at once in their proper element, the eggs are deposited in the water, each egg glued on to another until a raft-like mass, curved upwards at each end, and containing some two or three hundred eggs, is formed. The larvae are quaint looking creatures, with a big head and thorax and long tapering body, and they swim about head downwards. Near the tail, a straight branch, carrying a number of hairs at its tip, projects at an angle from the body. This is a respiratory tube, and communicates both with the outer air at its tip, and with the tracheal system at its base. All that is necessary for breathing, therefore, is that the tip of this tube should be above the surface. In the pupal stage an astonishing change takes place in the respiratory system; the entrance to it is now transferred to the opposite end of the body, and appears as two small twisted horns projecting from the gigantic head. If now the insect were to retain its inverted position, there would obviously be no possibility of bringing these breathing horns nearer the air than a whole body's length, therefore it turns a somersault in the water and henceforth goes about

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head uppermost The male gnat is a mild, inoffensive creature, but his spouse is armed with no fewer than five most murderous lancets, which she can use with great effect on any human beings she comes across.

The Ephemeridae or may-flies were next brought to our notice. These insects live but a few hours, for they have no power whatever of taking food; and, as they are utterly without means of defence, they are preyed upon by hundreds of enemies.

Another peculiar and interesting inhabitant of our ponds is the Caddis worm. He is remarkable in that he builds entirely round his body, and fitting close to it, a little tube or case of various materials,—bits of stick, grains of sand, small stones, shells of dead or even living mollusca, dead leaves, indeed, anything that can be utilized for the purpose. Having stuck these various adornments outside, he spins himself a lining to the case, of a material similar to the silk of the silk worm. As the insect grows, his case, which always fits him tightly, requires enlargement both in length and diameter, which is effected in the following way: First he builds another section of the case on the anterior extremity, rather larger in diameter, and as this makes the case rather too long, he then bites off a piece at the tail end to make the length right; thus, as each new segment is larger in diameter than the last, the case gradually assumes a conical shape.

The water scorpions and the water boatman were fully described by the aid of slides, and the marvellously complex breathing arrangements of both creatures were explained.

The insects that first catch our attention on looking at a pond are the geridæ or skaters—blackish, spider-like things, floating on the surface, and jerking themselves rapidly along by vigorous strokes of their long thin legs. These legs are six in number; the front pair are short, and rest upon the water at the tips; the middle pair constitute the rowing organs, and the hind pair act as rudders to steer the insect in its rapid movements.

One of the most beautiful objects in a pond is the water spider. These spiders breathe air, and in order to provide themselves with a supply of that commodity, they build a nest of spider's web under water, in shape like a thimble, with its open end downwards. When they dive, the whole of their body and legs being covered with fine hairs, they carry down with them a quantity of tiny air bubbles. Entering the nest, the detach the bubbles of air, which rise and displace the water, thus making the nest into a miniature diving bell, inside which the spider lives.

Finally, many interesting facts were related about the

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hydra vulgaris, the water fly, and fish parasite; the vorticella, diatoms, volvox globator, desmids, and other lowly forms of life to be met with in a pond.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, June 11th.

A. Petrocokino, Esq., gave a lecture on "Japan and Corea."

Mr. Petrocokino commenced by giving a short historical sketch of the country and its inhabitants, explaining their adoption of western ideas. Then with the help of some excellent slides, he pointed out some curious customs of the Japanese, among which were the following: the Japanese dislike being photographed, and consequently in one or two slides, their faces were covered by their hands. They do not greet one another by shaking hands, but by bowing. Every native house in Japan is made of bamboo, owing to the frequent earthquakes; even the walls are made of paper; consequently it is easy for a person to see what the occupant of the next room is doing, for he simply moistens his finger and makes a hole in the wall, thereby making no noise. The men are dressed in tight blue pants and wear a blue tunic and sandals. The women powder and paint their faces, and wear broad bands round their waists, with a huge bow behind. Pictures were then shewn of the rickshaw, which is the characteristic vehicle of the country. The rickshaw men can run long distances without tiring, and manage to proceed at a good pace.

The Japanese army is now provided with boots since it has to face cold weather, the soldiers however hate wearing boots, and whenever the weather is warm enough they take them off and hang them round their necks. Whenever a man, Japanese or English, enters a house in Japan, he has to take off his boots or sandals, and so outside a theatre or temple piles of sandals are often seen. There are two religions in the country, the Buddhist and the Ashinto. The Buddhist temples are full of images. The bell which rings at either of these temples is not furnished with a clapper, but is rung by means of a huge beam which is swung on chains, and beats on the outside of the bell.

The Japanese food is quite plain, consisting chiefly of rice. Bread is not made at all. Most of the customs of the country are copied from China. At five o'clock every Jap has his bath in the courtyard of the house, all the occupants using the same water. Japanese ladies have their hair stiffened and in order not to disarrange it at night, they sleep with their

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necks on a block of wood, which is covered with a napkin.

There are scarcely any trees in Japan, all the wood having been cut down for fuel; even railway bridges are made of bamboo. The Japanese take life very easily, every now and then they have festivals to celebrate such events as the full blossom of flowers.

The lecturer then showed some slides of a Geisha performance, during which the elder women sit at the back and play, while the young ones act and sing. Japanese girls seem to be always laughing. He then gave an account of a Japanese feast which lasts an enormous time, at the end of it the partakers are quite helpless, and have to be taken home. Their chief drink is saki which is made from rice and Mr. Petrocokino described it as being most offensive and tasting strongly of turpentine. He next shewed a picture of a huge Buddha of stone which was built in 1252. Its height is 50 ft.

In Japan sanitary arrangements are of a very primitive nature, household refuse being carried away in barrels on the backs of oxen. However the Japs are very careful. In other ways also they shew their care and preciseness. When carving a model of any description, they will always ornament the part which does not show. Pictures were shown illustrating the method in which the Japanese coal their ships. Two long lines of men reach from the coaling barge to the coal bunkers of the ship. Down one line they pass baskets full of coal, and when these are emptied, they are passed back by the other line. This is a very cleanly and even quick arrangement.

Mr. Petrocokino concluded his lecture with a short description of the Koreans. These people live in towns made of mud. All the roofs are thatched, and in order to prevent the walls from falling apart they are tied together with ropes. The men are dressed completely in white, and wear large baggy trousers which are tied at the ankle. The chief beasts of burden are bulls. The last slide shewn was of the walls of Pekin, which have huge towers at intervals of almost half a mile.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, July 2nd.

F. Brett, Esq., gave a lecture on "Prehistoric Animals."

The lecturer commenced by saying that he would not touch on all forms of animal life of which we now find remains, but would deal solely with the vertebrates, those animals which have a backbone or spinal column. He wished it to be understood how extremely difficult was the reconstruction of

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these animals from the skeletons we find, many of which are far from perfect. The oldest vertebrates were those which lived in the seas of the old red sandstone period. These consisted only of fish, many of which were protected by an armour of bony plates. Mr. Brett then turned to the carboniferous period and showed a picture of a forest of that period. He himself did not think it could have looked so beautiful as there was a great monotony in the vegetation, which consisted largely of a rank growth of fern-like trees. Its most characteristic trees were the lepidodendron, the sigillaria and the reed-like calamites of which the horsetail is the modern representative. These are the forests of which coal was formed. During this period the amphibians or labyrinthodons first make their appearance. The first name suggests they were equally at home on land and in water. The second name was given on account of the labyrinth-like structure of their teeth.

He then shewed a picture of a sea in early secondary times; there were abundant corals in it, lizards swimming in, and other lizards flying over it. Then came pictures of the icthyosaurus, the plesiosaurus, two most important saurians. The first of these reptiles was fish-like in appearance; it was built for strength and had an eye which measured one foot in diameter and which was protected by bony plates. The plesiosaurus on the other hand had a long thin neck and was built for speed. They were both marine animals and the lecturer shewed a very realistic picture of a fight between them. Several more reptiles were shown upon the screen including the claosaurus, a herbivous dinosaur which sometimes was as tall as 60 feet and weighed as much as 30 tons, the atlantosaurus whose thighbone was shown to be longer than a man is tall and the keratosaurus which was armed with a powerful horn for offensive purposes. Then came the first of the birds, the archaeopterix. Its remains have been found in the Bavarian limestone. It had a tail like a lizard with feathers on it, teeth in its beak and claws on its wings and was about the size of a pigeon. There were many birds living during the cretaceous period, all of which were marine. One of these, of which a picture was shewn, was a huge diving bird.

The lecturer mentioned that the pterodactyl, although a flying animal, was not a bird but a reptile. It had membranous wings joined to the little finger of its arm, that finger being elongated to support the wing. These reptiles had spread over the whole world on land and in the sea: this we know because their remains have been found in every part of the world. Yet in a comparatively short time, as time is reckoned in

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geology, they died out and became extinct. The last of the dinosaurs was remarkable for its bone collar shield and its huge head which it had developed at the expense of its other members.

After the cretaceous period there comes a great change in animals and plants. Mammals first make their appearance. There were however few types during the early tertiary period. The ancestry of the horse can be traced right back to these times. Its earliest ancestor is the phenacodûs which had five toes on its foot. As time went on other animals were evolved which did not use these toes and so they disappeared. The ancestor of the horse which was contemporary with prehistoric man was the hipparion. It had three toes on each foot but two of these did not touch the ground. The lecturer then showed pictures of early forms allied to the elephant, namely the mastodon and the mammoth. The mastodon had greater development in the lower part of its skull and the mammoth much more curved tusks than the elephant. He shewed also pictures of the Irish elk whose remains have been found in the peat bogs of Ireland, and of the woolly-haired rhinoceros, an artic animal which had two horns on its nose. Primeval man has left drawings of some of the animals contemporary with him on bones and tusks. These are found mainly in caves in the South of France and Switzerland, and show representations of the mammoth, bear, fox and reindeer. Pictures of several of these were shown and then an imaginary picture of prehistoric man himself and how he hunted the mammoth.

A vote of thanks to the lecturer was proposed by Mr. Wright.

Saturday, July 16th.

J. P. G. Worlledge read his Essay on "Glaciers and the Glaciation of a District in South Wales," for which the Pender Prize had been awarded.

As the main part of the essay was to be on the glaciation of a specified district in South Wales, it was thought as well to explain, first of all, how the traces left by glaciers are now being formed.

The glaciers themselves are formed from snow, compressed in the lower layers of the névé, or mass of ever accumulating snow above the snow line at high altitudes or latitudes. This snow becomes compressed into ice, and passes down the nearest valley as a glacier or river of ice. The masses of rock and stones that fall from the valley sides on to the glacier, form what are called moraines—long lines of débris stretching along both sides of the glaciers. When two glaciers meet,

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their lateral moraines combine to form a medial moraine. Often, especially when large blocks fall on to the glacier, they eventually spread all over it, as on the Zmutt glacier, Switzerland, and these, when the glacier melts, are left as erratics and perched blocks all along the valley. When a glacier passes over rough or broken ground or over a sudden change of inclination of the bed, crevasses, or huge cracks are formed in the ice, and when a number of these cross, seracs or pinnacles of ice are formed. Down these crevasses fall masses of the material composing the moraines, and these blocks serve as tools, both scratching and becoming scratched by the motion imparted to them by the glacier. When all these moraines meet at the end of the glacier, a large mound of loosely piled material from huge blocks to finest sand, is formed, known as a terminal moraine. On account of their size, these are the most prominent remains left by glaciers. Cirques or corries are huge amphitheatres in the solid rock probably formed in the first instance by the action of a glacier descending sheer into a valley, and subsequently by the ordinary denuding action of streams.

The district chosen for the essay, lies to the west and south west of the town of Brecon in South Wales, and comprises the high ground of the Brecknock Vans or Beacons, and the valley of the Usk, for some eight miles above Brecon. The older glacial deposits are not much in evidence, but plenty of traces of the later periods are to be found, especially as moraines. These are mounds of no very great size stretching across the main valleys, and contain many stones striated and polished by ice action. Occasionally these moraines dam back small lakes as in the Brecons and the top of Cefn Llwyched, one of the hills bordering the Usk valley. Eskers are semi-stratified mounds of débris stretching down the valley. Drift or spread out moraine stuff, is found only up at Penwyllt, to the south-west of the Beacons. Erratics occur sparsely scattered along the valleys, and in great quantities up at Penwyllt.

At Penwyllt, the main features are a deep, steep valley, with large tributary valleys of which the chief is that of the Byfra. Moraines occur near the head, middle and bottom of this valley. The topmost is quarried for silica, the material of which it is formed being nearly pure quartz and felspar, and is used for brick making. The middle dammed back a lake in which a large quantity of peat formed the lake eventually draining off down a fissure in the limestone just above the moraine, and down which a small stream now flows. On the further side of the main valley occurs another interesting case, where a stream issues from the limestone, just underneath

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where once it flowed over a waterfall. From these and other facts there seemed no doubt at all that glaciers passed down these valleys with occasional intermediate phases of partial amelioration of the climate. To pass on to the Usk Valley, moraines at intervals of from a quarter to two miles are common, some seventeen being found in less than eight miles. Some two and half miles above Brecon, the Usk, which generally flows in a broad stream, contracts and passes through a narrow gorge; a moraine had dammed it back and caused it to over-flow the solid rock, and so cut a fresh valley for itself passing round a hill on the side remote from its old valley, which can still be discerned. A broad terrace or ledge travels along both sides of the valley for its whole length, occurring also at Penwyllt and in the Beacons. The Beacons themselves rise somewhat abruptly from the general level of the surrounding country, and consist largely of spurs running N.N.E. The heads of these valleys are cirques or corries as they are usually known locally, and in the largest of these lies the moraine-dammed Llyn Cwm Llwch. Erratics and drift are plentiful here, and the terrace very plain. In conclusion, it would seem evident that glaciers descended from both sides of the Brecknock Beacons, many uniting over the site of the present town of Brecon. The terrace is all that remains of an old upheaved valley bottom, which was cut through by the present river.

The Essay was illustrated with a number of slides made by Worlledge himself, from his own negatives.

At the conclusion Mr. Hagreen after giving a short account of the foundation of the Prize, said that Worlledge had shewn great power not only of making and recording observations, but also of reasoning from them. It was to encourage such work that the Prize had been established, and he thought that the Essay might well be taken as a model by many of those present, who would in future years be competing for the Prize.

Mr. Blundell then shewed a number of slides prepared by members of the Photographic Section; they all represented Natural History subjects, and had been taken chiefly by E. F. A. Hay, W. E. Pain, J. H. Hay, H. F. North, H. P. A. Hagreen and L. Field. A few of the best are reproduced on another page.

A vote of thanks to Mr. Blundell was proposed by the President.

Saturday, October 8th.

A. F. Middleton, Esq., gave a lecture on "The Sun, Earth and Moon."

Commencing with the sun the lecturer shewed that it was

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the centre of the solar system, and the order in which the planets revolve round it was illustrated by a moving slide. Passing on to the surface of the sun, photographs of sun spots were shewn and Wilson's hypothesis, in accordance with which the spots are supposed to be depressions in the surface, was explained. It was shewn that the spots are closely connected with terrestrial magnetism and that in many instances the passage of a large spot across the sun's central meridian has been accompanied by a more or less violent magnetic storm. Passing on to the moon, which, like the planets, shines only by reflected sunlight, the temperature at the surface was stated to be very low since there is no atmosphere to retain the heat received from the sun. Photographs of the moon taken at the Lick Observatory in California were shewn and some of the principal formations pointed out, including the so called seas, which are now known to be extensive smooth plains, the ring mountains, and some of the principal rills or cracks in the surface.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, October 22nd.

The REV. CANON FOWLER, D.SC., F.L.S., F.E.S., gave a lecture on "Some devices by which animals, birds and insects are enabled to hold their own and survive in the struggle for existence."

The lecturer after a short reference to the constant struggle for existence which is proceeding among all living organisms pointed out that colour was one of the most common means of which animals avail themselves both for purposes of offence and defence. Excellent instances of animals adapting themselves to the colour of their surroundings are to be found in the entrance hall of the Natural History Museum, South Kensington, where a group of desert animals are all of the same tawny brown as the sand on which they lived, while an adjoining case shows a group of vivid green forms dwelling in and adapted to the foliage of a tropical forest. For the same reason arctic animals are usually white, and so far is this power of adaptation to environment carried that many, for instance the stoat and the arctic hare, change their colour periodically, becoming white in winter when it is of most advantage to them. Some animals such as the zebra whose colouration at first sight appears to catch the eye have been shown to be almost invisible in the dusk by those who have seen them among their natural surroundings. In the jungle the tiger's stripes, and in the patches of light in the forest the spots of the leopard and the giraffe, harmonize admirably with their respective surroundings.

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Most birds and mammals are dark above and light below because the light coming from above reduces the whole form to the same tone and so prevents it attracting notice.

Passing from the subject of general adaptation to the surrounding colouring the lecturer next proceeded to protective mimicry, that is the imitation of some definite form with a view to deceiving the animal's enemies. To illustrate this several cases of butterflies which disguised themselves as leaves, of caterpillars like twigs, and of fish which looked like sea weed, were thrown on the screen.

Birds eggs were shown to be frequently marked and coloured so as to be almost invisible, and it was pointed out that this was especially the case where the nest was made on the ground and therefore was less protected. Eggs which are laid in holes need no protective colouring and are therefore white or blue. Many young birds which can run or swim as soon as they are hatched are also protectively coloured.

Some animals were shown to have the power of temporally changing their colour, as the chameleon and the prawn, while the trout possesses this power to a smaller extent. From the fact that one of the above animals, if blind, loses this power, it is probable that the change is due to the effect of the surrounding colours on the eye.

Some animals however so far from being coloured for concealment are so marked that they attract attention at once, such are the skunk with its prominent stripes and aggressively white tail, or the wasp with its black and yellow stripes. All animals which possess such warning colours as they are called, are found to belong to two distinct classes—they either have some potent means of defence, or they pretend they have, that is they so closely imitate another animal which has such means, that they are left undisturbed.

The frilled lizard which runs on its hinds legs and spreads out its frill to look more ferocious than it feels; the angler fish which dangles its luminous bait on the deeper parts of the ocean bed, and the crab which puts a pair of stinging sea anemones on its claws like boxing gloves, though the lecturer would not vouch for the truth of this, brought a most interesting account of animals' devices to a close.

A vote of thanks to the lecturer was proposed by Mr. Elton.

Saturday, November 12th.

H. W. Monckton, Esq., F.G.S., (O.W.), gave a lecture on "The Geological History of the country around London."

The lecturer began with the chalk period when a deep sea covered our area. It was a sea of great extent covering most

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of England and France, Denmark, much of Germany, of Austria, of north Italy and a vast track in southern Russia. There are, however, signs of shore conditions in north Ireland, in Scotland, in north-east France and in Belgium.

There is a great hiatus in England between the chalk and the next overlying strata, for both the top of the cretaceous and the bottom of the eocene are wanting in this country. The junction is marked in most parts by a bed of green coated flints the origin of which was discussed. Above this flint bed there is, in the east of the London district, a thick bed of sand with but little sign of bedding and a few marine shells (the Thanet sand), and above it a bed of green sand with, in places, oysters and fish teeth and a few marine shells. (Bottom-bed of the Woolwich and Reading series). At Reading the Thanet sand is absent, so the green coated flints are found in the bottom of the oyster bed. The Reading leaf bed was then dealt with and the mottled clay. It was suggested that these were of freshwater or lagoon origin.

As we go eastwards from Reading we find these freshwater or lagoon beds gradually passing into an estuarine series, and eventually in Kent there are sands of this age with marine shells. In the brickfields near Guildford station there is, above the mottled clay, a thin band with estuarine shells which, the lecturer said, was the most westerly point at which he had seen the estuarine phase of this Woolwich and Reading series.

The Blackheath pebble beds were described and a photograph of a very fine section of them at Chislehurst was shown. At that place oysters—pectunculuii and cyrenae—were abundant.

The basement bed of the London clay, which next follows, is a littoral deposit and is very fossiliferous at Reading and other places. The London clay itself is of marine origin and was probably deposited in a sea such as the North Sea. Fossils are plentiful in places and photgraphs of specimens collected by the lecturer at Bracknell, Wokingham and near Hook were shown.

The Bagshot beds were described at some length. In the London basin they appear to be mainly of marine origin. Casts of shells are common near Ascot and at Tunnel Hill near North Camp Station. The last marine beds in our district are the Lenham beds of early pliocene age and the most westerly patch of them is at Netley Heath near Guildford.

The lecturer thought it possible that the Lenham bed sea did not extend west of Guildford and that the Reading part of the London District may have become dry land before pliocene times. However that may be the whole area

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gradually emerged from the sea and has not in his opinion been since submerged. He divided this land period into nine stages.

Stage 1. The sarsen stones of Chobham Ridges, etc., were he thought probably relics of a very old land surface.

Stage 2. The gravels with large flints of Upper Hale and Caesar's Camp, Aldershot, of Newland's Corner near Guildford, etc., probably very early river gravels.

Stage 3. The old Thames gravel of Goring Heath, Cane End, etc.; the Kennet gravel of Bucklebury Common, etc., and the Blackwater gravel of Chobham Ridges, Finchampstead Ridges, etc.

Stage 4. The glacier gravel and the chalky boulder clay belonging to the climax of the glacial period.

Stage 5. The hundred feet terrace gravel of the Thames with palaeolithic implements.

Stage 6. The fifty feet terrace gravel of the Thames.

Stage 7. The beds of Crayford and Grays with *Corbicula fluminalis.*

Stage 8. The twenty-five feet terrace gravel of the Thames which at Grays overlies the Corbicula beds.

Stage 9. The alluvium of the modern rivers.

The lecture was illustrated by a series of lantern slides made by the lecturer for the most part from his own photographs.

A vote of thanks to the lecturer was proposed by Mr. Blundell.

Saturday, November 26th.

A. W. Andrews, Esq., F.R.G.S., gave a lecture on "Wild Coast Scenery of England and Wales. The Cliffs of Cornwall and Pembrokeshire."

The lecturer, who was an ardent climber, said that for more than 25 years he had examined the district on the north coast of the Land's End peninsula, between S. Ives and Cape Cornwall, without exhausting its possibilities. The best climbing is on the granite, which is most prominent at Wicca and Bosigran. At Wicca the comparatively low cliffs terminate in a tumbled mass of granite columns, among which the Wicca Pillar stands out prominent, presenting some of the best crack and gully climbing in the district. At Bosigran the headland breaks off in steep cliffs with some pitches of 200 feet, towering over the Bosigran Pinnacle that rises some 150 feet from the sea below. The scenery is far superior to that of Land's End and Gurnard's Head upon which all the excursions are focussed. Below the moor lies a steeply

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sloping hill side, covered with heather and gorse, and lower down a gently undulating plateau leads to the cliffs which begin a little above the 200 feet contour line. In Pliocene times the sea probably stood about 340 feet higher than it does now, and the steep hillside was the cliff then formed, the plateau below being the plain of marine denudation. When the land again rose, the modern sea began to form the present cliffs. The evidence for this is found in the S. Erth beds, a few miles to the south-east, which are supposed to have been laid down some 240 feet below the surface of the sea, and are now 100 feet above the present sea level. Granite appears in the west half of Wicca Pool, the rest of the coast consists of greenstone or trap and Devonian. This greenstone is a basaltic rock which penetrated the Devonian prior to the rising of the granite. There is a certain amount of climbing on both the trap and the Devonian, but it is inferior to that on the granite.

In the granite the joints, of which there seem to be three sets, are particularly well developed. The first set, known as the "Floor" joint, may or may not be horizontal; the second set, known as the "Cleaving Way" joints, divide the granite vertically in the direction N. 10° W.; the third set, known as the "Tough Way" joints, are at right angles to the "Cleaving Way" joints. The logan rocks which exist in the district, some of them quite as fine as the well known logan rock near Penzance, shew the influence of the "Floor" joint when it is fairly horizontal.

Comfortable quarters may be found at Zennar within easy reach of both Wicca and Bosigran, and a number of most interesting climbs in this district were very graphically described with the help of a series of excellent photographs.

Besides climbing, the country has many features of interest such as old tin mines whose ruined shafts, half covered with vegetation, bring to mind the former activity of the district. Only one, at Levant, is now worked in the whole Land's End district. Between Gurnard's Head and Bosigran there is an interesting water wheel which still extracts a considerable amount of tin from the old tailings, neglected in more prosperous days. There are also cromlechs, hill circles &c., of great historical interest; but the charm of the region lies in its magnificent cliffs and its wild sweep of moorland with granite tors, which give the scenery a character quite unlike any to be found elsewhere.

A vote of thanks to the lecturer was proposed by Mr. Armstrong.

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Saturday, December 10th.

The Rev. G. B. CRONSHAW gave a lecture on "Waves in water, sand and air."

The lecturer commenced by saying he was going to speak about short waves which affected only water near the surface of the sea, not about the long tidal wave whose effects extended throughout the whole volume of the ocean. He then shewed some photographs of waves taken off the Cornish and Sussex coasts, and illustrated the enormous energy which they possess by shewing the destruction they cause in the cliffs and rocks against which they beat. He shewed also how, when two sets of waves of different lengths were travelling in the same direction, the resultant motion gave a succession of low waves followed by others of much greater height in regular sequence. Following these were some pictures of rollers taken in Mid-Atlantic. He shewed also some photographs of waves caused in still water by the passage of a steamer and explained how important it was to consider the shape of these waves in the construction of a ship; this was illustrated by photographs of the great experimental tank at Haslar in which wax models are tested before a ship is built in order that its lines may be correct.

He next passed on to sand dunes, pointing out the similarity between waves in sand and water; then followed some beautiful slides of ripple marks made in sand by the retreating tide. One slide shewed two sets of waves crossing one another at right angles, and another corresponding ripple marks in sand. These ripple marks may occur when there is no real wave motion in the water, as at the bottom of a steadily flowing stream, they are then caused by small eddies in the water set up in the first instance by some slight inequalities in the sand. These may be studied by following the motion of a drop of ink inserted through a pipette.

The lecturer then shewed some cloud photographs and pointed out the similarity in form between the lines in a mackerel sky and the ripple marks which had just been considered, and explained how these clouds were formed at the common surface of two currents of air moving in different directions.

Pictures of similar waves formed in snow fields were then shewn, as well as some of the remarkable formations known as snow mushrooms.

Finally a few slides were shewn of the billow-like surface formed by dragging heavy loads of timber over an un-made road.

A vote of thanks to the lecturer was proposed by Mr. FitzGerald.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Tuesday, February 2nd.

At a P.B.M., D. P. H. Robarts, V. H. Seymour, R. J. S. Tyhurst, R. H. Muir, E. J. B. H. Sadler, S. R. Wason, N. M. de la P. Beresford Peirse, F. N. Lane, T. B. S. Marshall, J. R. Trinder, R. M. Johnson, H. S. I. Pearson, R. G. Findlater, P. K. Boulnois, C. L. Brereton, J. A. Jervois, L. S. Lindsey Renton, G. B. Samuel, V. N. Rowsell, F. M. G. Griffin, R. V. Montgomery, O. H. Tidbury, F. J. C. Holdsworth, B. H. Bonham Carter, F. C. De Butts, R. L. Bald, A. W. Turner, R. Sykes Banks, C. Sykes Banks, C. Coles, W. de Geijer, W. G. S. Mitchell, J. H. S. Tyssen, G. C. C. Strange, A. J. Scully, H. A. Garstin, R. D. Wright, W. Scott Moncrieff, G. C. Turner, L. B. Paget, D. Wynyard, G. S. Sansom, V. C. Cassidy, R. B. Tower, H. R. F. Sullivan, were elected Associates.

The President gave notice that he would move to omit in Rule 3 all the words from "That only Members of the Upper School" to "Science or Art," and to substitute for them "That all Members of the School be eligible as Associates."

At a Committee Meeting, F. H. Huleatt was elected a Member.

Tuesday, February 9th.

At a P.B.M., the alteration in Rule 3, of which notice had been given at the previous meeting, was proposed and carried.

G. E. Blundell, Esq., was elected a Vice-President. E. A. Downes, Esq., Rev. H. Gray, W. H. Wright, Esq., W. H. Kennett, Esq., were elected Hon. Members.

Lord G. Wellesley, A. L. Y. Dering, Lord C. N. Hamilton, H. S. Irwin, C. Heigham, R. H. E. Johnson Smyth were elected Associates.

Saturday, February 27th.

At a P.B.M., G. A. F. Maitland, M. G. P. Willoughby, C. E. D. King, were elected Associates.

Saturday, March 26th.

At a P.B.M., R. S. J. Faulknor, A. F. S. Napier, N. S. Mansergh, were elected Associates

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Tuesday, May 24th.

At a P.B.M., T. Hare, F. W. Metcalfe, C. W. Trevelyan, J. C. Swayne, E. F. A. Hay, J. H. Hay, W. T. O. Crewdson, F. L. M. Crossman, R. W. D. Sandford, E. W. McArthur, W. E. Pain, W. A. P. Foster, L. Field, A. C. Tod, N. Field, M. M. Magrath, J. F. P. Butler, A. L. de Cordes, B. L. Clarke, R. B. Walker, W. H. Carew, F. F. Francis, C. W. Maxwell, A. G. Paterson, W. R. Bertram, W. M. Fowle, F. E. Buller, S. Des Voeux, H. R. Pollock, E. P. F. Schweder, N. H. T. FitzRoy, H. C. Christopherson, A. C. P. Butler, J. H. Brougham, E. H. T. Broadwood, A. E. Lawrence, M. P. Beadnell, C. A. Linton, R. H. Allanby, G. J. D. R. Cruden, C. W. Lane, R. A. Mackean, R. G. A. Thorne, T. S. Wollocombe, L. D. G. Alexander, J. C. W. Francis, G. A. Anstey, C. A. Proudfoot, J. S. Sampson, A. S. Allen, G. C. Heath, R. F. A. Gavin, J. L. G. Irvine, B. Ivor Jones, L. G. E. Walcott, G. J. L. Buxton, G. J. Jameson, W. C. Wilson, P. V. Cornish, L. Errington, C. C. K. Campbell, J. A. Childe Freeman, E. V. B. Levinge, H. F. C. Skinner, F. F. Loyd, C. K. Wigram, G. H. E. G. Moore, L. R. Darwen, J. B. Bolitho, R. C. D. Potts, V. A. Beaufort, C. F. R. Hanbury Williams, were elected Associates.

R. G. Dainty, H. Knox Shaw were elected judges for the Pender Prize.

At a Committee Meeting, T. Hare was elected a Member.

Monday, October 3rd.

At a P.B.M., A. S. G. Kennard, R. L. Atkinson, J. R. Trinder, G. E. B. Scanlan, C. L. Brereton, A. J. Usborne, J. W. Pain, A. L. Auchinleck, C. A. M. Alexander, E. C. Whiteley, L. M. B. Salmon, P. Helyar, W. J. Davy, J. H. E. Shearme, W. F. Heyland, R. N. O'Connor, R. J. Saunders, F. J. Morgan, H. S. Duncan, N. R. Daniell, K. C. McPherson, W. H. L. O'Neill, J. E. R. Allen, J. W. Battersby, E. L. Paske, G. H. A. Pearson, H. M. Heyland, C. W. Carleton, G. Tayleur, C. W. Hooper, J. E. M. Mellor, G. D. G. Elton, M. A. Capron, R. B. Harward, D. J. Leacock, D. B. Mackintosh, J. O. Davis, L. Rumsey, N. S. Collier Johnston, were elected Associates.

Votes of thanks were passed to R. G. Dainty and H. Knox Shaw, the retiring Secretary and Treasurer.

A. S. G. Kennard was elected Secretary, F. H. Huleatt was elected Treasurer.

At a Committee Meeting, A. S. G. Kennard, H. F. North, E. F. A. Hay, J. H. Hay, were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time, until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later that the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus chosen by the winner, subject to the approval of the President.

The winner may, if he chooses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President, and obtain his sanction, before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some

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branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1904 was awarded to J. P. G. Worlledge for an Essay on "Glaciers and the Glaciation of a specified district in Breconshire," an abstract of which will be found on pp. 26-28.

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the Society, for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). Each collection must be accompanied by a note-book giving dates and localities for all the specimens, and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

III. One or more prizes are offered by the N.S.S. to Members of the Field Club for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being

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considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming these or any other specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1904, the prize in Group I was awarded to E. P. F. Schweder.

In Group II the first prize was awarded to L. Lawrence Smith.

In Group III the first prize was awarded to E. F. A. Hay, the second to W. E. Pain, a third prize was divided between L. B. Irwin and L. Field.

Two additional prizes for the next best Note-Books in order of merit were given by Mr. Broomfield: these were awarded to J. H. Hay and A. V. Olphert.

Photographic Prizes.

Mr. Blundell offered a prize, value £1, to Members of the Photographic Section, for the best photographs of Natural History subjects. This was awarded to E. F. A. Hay.

Mr. Longland offered a prize for the best photographs of Birds' Nests, Eggs and Young Birds. This was awarded to W. E Pain, *proxime accessit* J. H. Hay.

Mr. Perkins offered a series of prizes for enlargements which were awarded as follows:

First Prize, E. F. A. Hay, Subject "Goldfinch."

Second Prize, G. C. Heath, Subject "View from Paignton Pier."

Third Prize, H. P. A. Hagreen, Subject "Castle Rising, Norfolk."

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced.	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·84	34·3	18·5	30·9	30·6	95	10		E.
2	·89	44·1	29·3	31·7	31·4	95	10	·01	S.
3	·72	44·7	30·8	42·6	42·6	100	10	·05	S.W.
4	·59	43·2	31·5	34·5	34·4	99	10	·23	S.
5	29·84	43·2	33·7	41·4	41·4	100	10	·01	S.E.
6	30·26	41·4	29·8	35·9	33·6	80	10		S.
7	30·08	47·9	28·4	41·4	40·7	94	10	·06	S.
8	29·81	43·3	40·5	42·1	42·1	100	10	·02	S.W.
9	·83	45·5	33·5	36·7	36·6	99	10	·02	N.W.
10	·79	47·1	34·1	45·4	45·3	99	10	·23	S.E.
11	·83	44·2	31·6	40·1	39·9	98	10	·07	S.E.
12	·66	54·7	39·2	42·5	42·4	99	10	·14	S.E.
13	·31	54·6	42·1	51·2	50·3	94	10	·15	S.E.
14	·09	47·7	38·7	41·1	40·1	92	8	·12	S.
15	·69	44·1	35·3	40·7	37·1	72	10	trace	S.
16	29·85	38·9	31·8	35·9	33·3	77	6	trace	S.
17	30·22	46·7	27·4	34·1	32·0	79	6	·05	N.
18	·22	48·9	30·3	44·1	44·1	100	10	·02	S.W.
19	·35	47·1	43·7	47·1	46·9	99	10	trace	N.E.
20	·51	36·9	22·8	30·9	30·3	89	10	·03	N.E.
21	·41	43·1	24·8	36·1	36·0	99	10		N.W.
22	·64	40·7	19·7	32·4	30·1	83	10		N.E.
23	30·33	34·4	23·7	27·1	26·7	91	10		N.E.
24	29·32	34·5	26·4	27·8	27·0	84	10		N.E.
25	·12	44·4	27·4	31·4	30·7	89	10		S.E.
26	·98	48·5	30·5	44·1	43·7	97	10	·20	N.W.
27	·78	50·4	43·4	48·1	48·0	99	10	·57	S.W.
28	29·71	46·9	45·2	45·7	45·1	95	10	·12	S.W.
29	30·06	47·9	33·8	42·1	40·7	97	10	·15	S.W.
30	29·53	44·2	40·2	44·2	43·9	97	10	·51	S.W.
31	29·24	41·4	37·7	39·3	39·1	98	10	·27	S.E.
								Total	
Mean	29·85	44·4	32·4	39·0	38·3	93	9·7	3·03	
Mean for 22 years	29·96	43·3	32·5	37·8	36·8	90	8·3	2·03	

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FEBRUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·34	43·5	29·5	32·2	30·9	83	10	·20	S.W.
2	·22	45·4	31·4	42·1	41·9	98	10	·63	S.E.
3	·19	46·5	35·5	43·2	43·2	100	10	·24	N.E.
4	·37	47·4	37·2	43·1	40·1	84	10	·03	N.E.
5	·48	49·1	35·5	45·2	44·1	91	2	·05	N.W.
6	·42	44·6	36·3	40·4	39·7	94	10	·03	S.
7	29·59	47·9	33·1	35·5	34·3	89	7	·23	W.
8	28·97	49·9	34·9	45·3	43·6	88	10	·15	W.
9	·89	46·4	37·4	41·7	41·1	95	10	·27	S.E.
10	28·86	46·2	35·5	45·7	41·9	73	10	·36	S.W.
11	29·11	42·1	36·8	38·7	37·7	91	10	trace	S.W.
12	·80	49·9	31·6	40·5	40·1	97	10	·48	S.
13	·22	49·7	40·0	46·9	43·1	73	4	trace	S.E.
14	·08	46·9	36·3	39·1	36·2	77	7	·07	S.W.
15	·30	42·5	28·6	32·6	31·3	84	10		S.W.
16	29·49	43·1	31·8	35·9	34·0	84	8	·13	N.W.
17	28·88	39·3	32·7	34·2	33·6	92	10	·08	N.W.
18	29·43	40·7	29·3	32·4	31·2	84	10	·01	N.
19	30·03	50·9	27·9	36·1	33·1	74	4	·12	N.
20	29·83	52·1	35·5	50·3	48·6	89	10	·08	S.W.
21	·86	52·6	47·1	48·2	44·9	77	10	·01	W.
22	29·84	49·5	42·8	45·7	41·1	68	5		N.W.
23	30·14	46·2	28·4	40·1	36·1	70	6		N.W.
24	·15	42·9	26·9	40·4	36·0	67	2		N.W.
25	30·19	39·9	29·5	39·1	34·0	62	4	·01	W.
26	29·95	37·3	29·6	34·1	33·0	89	10	·02	S.W.
27	29·67	37·4	25·9	33·4	32·6	90	10		N.E.
28	30·21	37·1	27·7	31·1	30·5	90	5	trace	N.E.
29	29·99	33·3	24·3	29·3	29·0	95	10	trace	N.E.
								Total	
Mean	29·53	44·8	33·1	39·4	37·5	84	8·1	3·20	
Mean for 22 years	29·98	45·3	32·4	38·2	37·0	89	7·8	1·84	

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MARCH.

Date	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	29·87	35·5	26·9	32·4	32·0	94	8	·07	N.E.
2	·96	37·1	26·6	34·9	34·3	93	10	·10	N.E.
3	·96	37·1	28·2	35·1	33·4	84	10	·13	N.
4	·91	38·5	32·1	34·4	34·1	96	10	·09	N.E.
5	·89	41·2	33·1	38·1	36.6	87	10	·03	E.
6	·74	39·1	33·9	35·3	34·5	92	10	·01	N.E.
7	·60	50·1	34·5	38·9	38·5	96	10	·16	S.E.
8	·60	57·8	38·2	49·4	47·5	86	8		S.
9	29·87	59·1	29·5	50·1	47·3	80	4		S.E.
10	30·16	46·4	38·0	42·1	38·1	70	6		N.E.
11	·20	48·4	25·4	42·9	38·5	68	2		N.E.
12	30·19	48·2	22·8	40·2	37·4	78	8		E.
13	29·88	47·7	30·1	39·1	37·2	84	10		S.W.
14	·65	49·3	31·5	38·7	38·4	97	10		W.
15	29·92	46·7	33·5	41·2	37·4	71	8		S.W.
16	30·04	50·3	29·5	44·9	38·5	58	6		S.W.
17	29·84	49·9	27·4	42·9	37·4	62	10		S.E.
18	30·01	55·1	26·4	46·1	40·1	61	4		N.E.
19	·13	52·9	41·3	50·1	46·4	75	10	·06	S.E.
20	30·07	51·1	47·3	48·1	47·4	95	10		S.W.
21	29·88	53·4	45·0	48·4	46·4	85	10	·04	W.
22	30·24	48·5	27·7				3		S.W.
23	·31	48·4	38·7	46·5	40·9	63	8		N.E.
24	30·27		37·4	45·9	40·4	64	10	·04	N.E.
25	29·94	46.3	33·3	36·9	36·6	97	10	·01	N.E.
26	30·03	47·9	34·3	39·2	38·4	93	10		N.E.
27	·20	51·9	31·5	37·1	37·1	100	10		N.E.
28	30·18	52·7	36·3	42·7	40·2	81	10	·25	S.W.
29	29·55		42·2	50·5	44·9	64	10	·18	S.W.
30	·34	46·7	32·3	38·5	36·4	82	10	·08	N.E.
31	29·65	48·6	36·8	45·1	41·2	72	6	·04	N.E.
								Total	
Mean	29·94	47·8	33·3	41·9	39·2	81	8·4	1·29	
Mean for 22 years	29·89	49·4	33·3	41·6	39·6	83	7·3	1·77	

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APRIL.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·74	52·4	38·2	46·4	41·9	69	8		W.
2	30·19	53·3	37·4	49·4	43·9	64	6	·04	S.W.
3	29·88	55·1	45·4	48·5	43·4	67	5	·12	W.
4	30·04	52·7	37·4	46·4	41·2	65	10	·01	N.W.
5	30·04	55·1	42·2	50·2	48·2	86	10	·08	S.W.
6	29·85	58·3	48·3	54·9	49·8	69	4		S.W.
7	·81	55·9	36·3	50·9	44·7	61	8	·04	N.E.
8	·96	63·6	42·5	57·7	51·2	64	10	trace	N.
9	29·95	53·9	46·3	47·1	41·5	63	10		N.
10	30·01	52·2	35·8	45·5	40·1	64	5		W.
11	30·04	56·9	35·0	48·1	43·5	69	2		N.W.
12	29·81	62·8	35·5	54·4	49·8	71	10	·14	N.W.
13	·43	58·6	48·3	49·4	48·8	96	10	·01	S.W.
14	·59	67·2	43·7	57·7	52·2	69	8	·25	S.E.
15	·41	50·9	49·0	50·1	50·0	99	10	·37	S.W.
16	·74	59·8	37·4	50·7	48·2	82	8	trace	S.W.
17	29·91	62·3	34·6	52·6	48·5	74	0		S.W.
18	30·10	63·0	35·3	52·7	48·6	74	2		N.W.
19	30·14	63·0	37·3	56·2	49·0	64	4		N.W.
20	29·95	63·6	35·5	54·1	49·3	70	4		N.W.
21	30·10	49·9	43·4	47·1	43·3	73	10		N.
22	29·97	49·4	33·3	48·1	44·1	73	10	·24	N.E.
23	29·89	57·0	42·6	46·3	45·8	96	10	trace	N.
24	30·14	61·8	41·7	51·4	48·2	79	10		N.W.
25	·14	54·1	40·4	49·7	41·9	54	7		N.
26	·18	50·5	30·3	48·9	42·6	61	5	trace	N.
27	·08	57·8	35·9	48·4	44·1	71	8		N.W.
28	30·09	55·1	42·4	50·7	48·2	82	10		S.W.
29	29·98	54·9	48·1	52·9	50·5	83	10	·09	S.W.
30	29·92	57·8	49·5	51·7	51·2	96	10		W.
								Total	
Mean	29·94	57·0	40·3	50·6	46·5	74	7·5	1·39	
Mean for 22 years	29·88	55·8	36·8	48·0	44·5	78	7·1	1·44	

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MAY.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30.01	61·4	42·4	53·4	46·1	58	8	·15	W.
2	29.73	53·9	45·4	48·1	47·6	96	10	·22	S.W.
3	30.03	57·0	38·2	53·4	45·7	55	8		S.
4	.11	60·0	37·2	52·1	46·7	66	5		S.W.
5	30.04	62·0	44·5	53·5	47·8	66	10	·02	S.W.
6	29.80	57·0	41·7	51·1	45·5	64	10	·03	S.W.
7	.50	48·1	36·8	47·2	44·2	78	10	·04	N.E.
8	.50	48·2	33·3	43·4	39·1	69	8	trace	N.E.
9	.72	56·1	31·8	47·7	44·2	76	8	·15	E.
10	29.77	55·1	41·4	44·7	44·4	97	10	trace	N.W.
11	30.13	59·0	33·5	53·9	48·2	66	6	trace	S.E.
12	.15	63·0	46·4	58·2	53·8	74	10		S.E.
13	.23	65·8	49·6	57·9	55·2	84	10		S.E.
14	.02	69·2	52·8	60·2	56·2	76	8		S.W.
15	.08	67·5	43·0	54·9	49·2	66	0		S.W.
16	30.05	71·2	38·6	61·7	56·5	71	5		S.
17	29.83	67·7	53·2	63·7	59·2	75	10		S.W.
18	29.97	61·0	42·4	56·9	47·8	56	10		S.W.
19	30.13	62·6	40·0	56·1	47·3	52	5		S.W.
20	30.17	62·3	33·3	61·9	50·8	47	5	·82	S.E.
21	29.87	55·6	45·9	46·1	45·9	99	10	·05	S.E.
22	.99	57·1	44·4	50·4	49·5	94	10	·02	S.
23	·97	64·0	43·7	56·9	52·4	73	7	·15	N.W.
24	·94	61·0	50·0	52·5	52·2	98	10	·07	S.W.
25	·89	68·9	48·6	59·9	57·1	83	10	trace	S.W.
26	·85	69·9	45·2	64·5	60·1	75	10	·95	S.
27	29·86	62·8	57·1	58·4	58·4	100	10	·11	S.W.
28	30·06	63·0	53·2	54·7	54·5	99	10		S.W.
29	·17	70·4	45·2	62·4	56·8	69	0		N.E.
30	30·04	69·1	52·4	54·9	54·2	95	10	·09	N.E.
31	29·82	59·6	54·2	57·2	55·8	90	10	·17	N.E.
								Total	
Mean	29·95	61·6	44·0	54·8	50·7	76	8·2	3·04	
Mean for 22 years	29·96	61·7	42·4	54·1	49·8	75	6·9	1·81	

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JUNE.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·88	63·8	44·7	56·3	54·6	89	8	·20	N.E.
2	30·11	57·8	47·1	53·9	49·8	74	10		N.W.
3	·23	64·8	48·1	57·4	52·2	70	8		N.
4	·28	68·4	39·2	61·2	54·8	64	8		N.E.
5	·23	69·7	47·3	57·6	52·5	70	0		N.E.
6	·18	70·9	46·1	57·7	53·3	74	5		N.E.
7	·14	65·8	47·4	59·1	53·0	66	2		N.E.
8	30·01	61·8	46·9	52·1	48·5	76	10		N.E.
9	29·86	59·8	44·5	55·9	49·5	63	10	·13	S.E.
10	·81	62·8	50·0	58·1	57·1	93	10	trace	N.E.
11	29·98	59·0	49·3	54·1	52·3	88	10		N.E.
12	30·15	65·6	49·4	53·2	50·7	83	10		N.E.
13	30·12	68·1	51·0	63·6	57·9	69	8	·01	S.
14	29·95	64·8	53·0	60·2	58·1	87	10	·27	S.E.
15	·86	62·8	52·2	57·9	53·5	74	10	·03	S.W.
16	29·98	67·2	51·5	61·4	54·6	63	10		S.W.
17	30·09	65·1	52·2	63·1	55·2	59	10	trace	S.W.
18	·07	67·1	46·3	56·4	52·2	74	8		S.W.
19	·13	64·5	46·5	54·9	52·0	81	10		W.
20	·09	68·7	47·6	58·4	54·2	75	10		S.W.
21	·22	63·6	45·0	57·5	56·3	92	10		S.W.
22	·40	70·1	42·2	61·4	54·2	62	10		S.W.
23	30·31	69·1	41·2	62·1	54·8	62	8		S.W.
24	29·93	70·1	47·3	65·9	56·5	54	6	·15	S.
25	·58	63·3	50·2	58·1	53·6	74	10	·11	S.W.
26	29·84	67·5	41·6	60·6	55·3	70	5	trace	N.W.
27	30·09	69·4	41·7	59·9	53·0	62	5		N.W.
28	·22	74·9	40·2	69·1	57·0	50	4		N.W.
29	·13	75·1	44·2	69·9	58·1	48	0		N.W.
30	30·07	75·9	48·1	70·9	60·7	53	2		N.W.
								Total	
Mean	30·06	66·6	46·7	59·6	54·2	71	7·6	·90	
Mean for 22 years	30·05	68·1	47·4	60·1	55·5	74	7·0	1·95	

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JULY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	29·90	67·4	54·2	65·7	57·7	60	8	·38	W.
2	·99	65·0	48·3	61·1	57·2	77	8	·23	S.W.
3	29·98	69·2	52·5	57·7	56·7	93	10	·01	W.
4	30·09	69·1	47·1	61·3	55·5	67	8	trace	N.W.
5	30·04	67·7	53·2	60·2	58·2	88	8		N.W.
6	·11	73·1	50·2	67·4	61·9	71	6		N.W.
7	·19	70·4	54·0	64·1	60·4	79	10		N.W.
8	·26	78·9	52·3	70·1	62·1	61	2		N.W.
9	·26	82·2	49·3	74·1	63·1	52	0		N.E.
10	·23	82·7	52·2	71·5	63·3	60	0		N.E.
11	·24	75·9	52·2	71·4	63·1	60	0		S.E.
12	·02	79·9	55·2	72·9	64·1	58	0	·01	S.E.
13	·17	75·9	55·0	66·4	61·4	73	10		S.E.
14	30·14	78·9	53·8	68·1	61·9	68	5		N.W.
15	29·95	81·4	58·1	76·1	65·9	55	8		N.W.
16	30·10	77·5	56·2	66·1	62·7	81	10		N.W.
17	·23	83·9	49·8	69·7	62·4	64	0		N.E.
18	·29	76·9	55·2	69·7	63·4	68	2		N.E.
19	30·13	79·9	55·0	72·9	62·4	53	0	·02	N.E.
20	29·96	73·9	56·2	69·1	62·5	66	10		N.W.
21	30·03	75·9	47·9	69·2	60·7	59	4		N.W.
22	·11	73·9	50·3	67·7	59·2	58	10	trace	N.W.
23	30·05	77·4	57·6	72·9	64·1	58	8		N.W.
24	29·92	77·1	55·0	65·7	62·3	81	10		S.W.
25	·73	68·2	51·2	66·1	62·1	78	10	·33	S.W.
26	·68	69·9	57·3	64·7	59·7	72	8	·13	S.W.
27	29·80	68·9	56·8	59·9	58·9	93	10	·09	S.W.
28	30·07	71·1	57·3	65·4	62·4	83	8	·01	S.W.
29	·14	67·5	52·3	64·7	61·4	81	10	·29	S.W.
30	·04	74·4	60·9	64·9	64·1	95	10	·38	S.
31	30·05	73·5	56·4	62·3	59·9	85	3		W.
								Total	
Mean	30·06	74·4	53·6	67·1	61·3	71	6·3	1·88	
Mean for 22 years	29·99	70·8	51·4	63·1	58·6	76	7·0	2·20	

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AUGUST.

Date.	Barom. Reduced	Thermometers. Max.	Min	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·19	74·1	53·2	64·2	59·3	73	5		W.
2	·20	80·4	48·8	69·2	61·4	61	0		S.W.
3	·24	84·5	49·5	75·9	66·7	59	0		S.E.
4	·09	86·5	62·4	72·7	64·1	59	0	·22	S.W.
5	30·03	72·9	59·5	65·4	59·9	70	5	trace	W.
6	29·99	69·2	55·5	62·7	61·1	90	10		S.W.
7	30·15	71·1	52·7	62·7	57·9	73	2		W.
8	·23	72·1	53·8	64·9	57·5	61	0		N.E.
9	·19	71·9	45·7	62·7	55·4	62	0		N.E.
10	30·06	71·9	49·3	61·3	56·5	73	2	·06	N.E.
11	29·88	61·6	47·7	58·4	57·4	93	10	·46	S.W.
12	30·06	68·4	47·6	61·2	56·7	74	5		W.
13	·19	70·2	44·4	66·2	59·1	64	10		S.W.
14	30·09	69·9	52·8	65·4	61·1	75	10	·02	S.W.
15	29·81	69·7	56·5	62·9	56·8	67	10		S.W.
16	30·12	68·4	46·9	64·4	56·3	59	8	·25	S.W.
17	29·85	63·6	53·2	56·9	56·8	99	10	·06	S.E.
18	29·91	65·1	49·8	59·9	54·2	68	10	trace	N.W.
19	30·09	65·6	48·3	59·9	53·2	63	10		N.W.
20	·09	66·0	41·4	59·4	53·5	66	10		N.E.
21	30·10	66·3	40·2	60·7	55·2	69	4		N.E.
22	29·78	62·0	46·9	60·3	56·6	78	8	·14	S.W.
23	30·08	63·8	48·4	59·7	54·4	70	6	trace	N.E.
24	·19	63·0	41·2	56·5	51·2	68	10		N.E.
25	·19	65·0	37·7	60·1	52·2	59	2	·03	N.E.
26	·04	68·9	51·8	63·9	59·7	76	10	trace	N.E.
27	·12	71·9	47·9	62·1	58·6	80	8		W.
28	·23	77·1	47·6	67·7	60·1	62	0		S.W.
29	30·14	80·7	51·3	70·4	65·7	74	0		S.W.
30	29·88	73·5	54·0	70·2	63·3	65	7		S.
31	29·80	60·1	53·5	57·2	56·0	93	10	·50	S.W.
								Total	
Mean	30·06	70·2	49·7	63·4	58·0	71	5·9	1·74	
Mean for 22 years	29·96	70·0	50·7	62·1	58·1	77	6·8	2·19	

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SEPTEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·02	63·5	51·0	53·3	52·8	96	10		S.W.
2	30·19	66·6	49·5	56·4	54·2	86	10	·12	S.W.
3	29·95	65·0	44·7	56·5	56·3	99	10	·02	S.W.
4	30·16	67·2	38·0	58·3	53·7	72	0		S.
5	30·00	72·1	51·5	67·1	61·9	72	2	trace	S.
6	29·97	61·8	59·7	60·7	57·7	82	10	·02	S.W.
7	30·03	65·4	46·3	58·4	55·4	82	2	·24	W.
8	·13	59·8	44·5	51·1	51·0	99	10	·03	S.W.
9	·09	64·8	50·3	59·1	54·5	73	10		S.W.
10	·18	64·8	39·5	59·1	54·8	75	10		S.W.
11	30·19	65·8	38·2	58·5	53·6	72	2	·07	N.W.
12	29·98	61·6	49·5	53·4	52·8	96	10	·15	S.W.
13	·91	65·8	52·5	61·5	56·0	69	6	·03	W.
14	·72	58·0	45·1	55·7	55·0	95	10	·23	S.E.
15	29·96	62·6	51·5	57·7	56·0	89	10		S.E.
16	30·17	68·9	44·2	57·2	56·5	95	10		S.E.
17	·21	70·1	48·3	66·9	60·4	66	6		S.E.
18	·29	67·9	42·0	61·7	54·0	60	0		S.
19	·25	68·1	44·5	63·1	54·3	56	0		S.
20	·26	62·7	40·8	59·4	49·3	50	0		S.E.
21	·18	59·8	37·4	55·9	48·8	60	10		S.E.
22	·07	59·8	45·0	57·9	51·2	63	8		N.E.
23	·13	60·0	48·6	53·9	48·8	69	10		N.E.
24	30·03	60·2	49·2	57·9	53·0	72	10	·05	N.E.
25	29·83	57·8	42·0	50·4	49·3	92	10		N.E.
26	29·98	62·8	33·7	57·7	54·2	79	7		S.W.
27	30·05	63·0	33·5	52·1	51·0	92	4		S.W.
28	·11	67·1	39·5	54·1	53·2	94	10		S.W.
29	·16	62·8	37·0	54·2	52·5	88	4		S.W.
30	30·04	59·8	33·8	51·9	51·8	99	10	·32	S.E.
								Total	
Mean	30·07	63·9	44·4	57·4	53·8	80	7·0	1·28	
Mean for 22 years	30·02	65·5	47·5	58·2	55·1	82	7·0	1·86	

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OCTOBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·76	60·0	51·8	59·4	58·9	97	10	·02	S.W.
2	29·98	53·9	37·6	45·2	44·9	98	10	.18	S.E.
3	30·23	60·1	44·8	51·5	49·2	84	10		N.E.
4	·24	61·8	36·5	56·2	55·0	92	10	trace	N.E.
5	30·01	59·4	49·2	57·4	54·2	81	10	·11	N.E.
6	29·65	56·9	50·0	53·7	50·6	80	10	·40	N.E.
7	29·58	51·2	44·0	48·7	48·2	96	10	·01	N.E.
8	30·04	50·1	38·2	47·9	43·4	70	10		N.
9	·26	56·6	30·7	41·4	40·7	94	10		S.W.
10	·25	58·4	41·2	52·2	50·6	89	10	·03	W.
11	·25	59·8	51·3	57·9	55·2	83	10		N.W.
12	·28	57·8	45·3	55·7	53·0	83	10		N.E.
13	·35	57·6	29·6	51·1	46·7	72	10		E.
14	·16	56·7	36·8	52·1	47·3	70	5		S.
15	30·00	55·5	27·6	50·4	45·9	71	4		S.E.
16	29·97	55·7	35·6	42·7	41·2	87	10	·30	S.W.
17	29·85	61·6	42·2	55·5	55·2	98	10	·07	S.W.
18	30·19	65·0	55·0	60·9	58·9	88	10	·01	S.W.
19	·45	59·0	48·1	53·9	53·8	99	10	trace	S.W.
20	·29	63·6	51·8	54·9	54·6	98	10		N.E.
21	30.00	63·3	52·0	56·7	55·2	89	10	·09	N.E.
22	29·80	60·5	51·2	54·1	53·0	93	8	·05	N.E.
23	29·80	57·0	39·2	46·7	46·7	100	10	·18	N.E.
24	30·03	56·4	46·3	53·1	53·0	99	10	·07	S.W.
25	·24	55·1	34·6	48·2	47·2	92	0		S.W.
26	·24	57·8	41·5	52·7	49·2	77	6		N.E.
27	·24	55·1	31·5	42·4	42·4	100	10		E.
28	·14	59·1	38·2	54·4	50·2	73	3		N.E.
29	·25	54·9	31·6	49·1	47·0	85	0		N.W.
30	·13	48·7	45·3	48·1	46·7	89	10	·04	E.
31	30·11	47·9	44·2	45·9	45·6	98	10	·03	N.E.
								Total	
Mean	30·09	57·3	42·0	51·6	49·8	88	8·6	1·59	
Mean for 22 years	29·91	56·4	41·2	49·6	47·7	87	7·4	3·06	

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NOVEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·26	49·9	44·4	47·7	47·5	99	10	trace	N.E.
2	·46	53·9	45·4	48·9	46·4	82	8		N.E.
3	·35	57·0	43·4	53·1	49·2	75	5		S.W.
4	·29	51·9	38·4	49·0	48·5	96	10		N.
5	·08	56·9	45·4	51·1	47·8	78	5	·01	N.E.
6	30·04	53·4	38·0	45·1	44·7	97	10	·45	N.W.
7	29·74	49·9	44·7	48·7	48·4	98	10	·42	W.
8	·92	56·9	39·2	46·1	42·1	72	10	·12	S.W.
9	29·63	58·1	45·2	55·4	54·5	94	10	trace	S.W.
10	30·03	55·2	43·4	51·2	50·2	93	10	·47	S.W.
11	29·95	58·6	44·8	54·7	53·8	94	10	trace	S.W.
12	30·22	55·1	42·4	50·7	48·8	87	3		S.
13	·39	54·2	28·9	33·9	33·3	93	5	trace	N.
14	·51	46·1	32·1	38·4	38·4	100	10		N.W.
15	·49	56·9	25·4	45·1	44·1	92	10		N.W.
16	·42	52·7	35·5	47·1	46·2	93	10	trace	N.E.
17	·49	45·1	40·2	43·2	43·2	100	10	trace	N.E.
18	·36	48·9	33·3	40·7	40·7	100	10	trace	N.E.
19	·17	51·1	39·5	48·4	48·2	99	10	·01	S.W.
20	30·05	46·4	34·8	36·5	36·1	96	10		S.W.
21	29·90	45·3	29·6	36·9	35·6	88	5	·12	N.W.
22	·49	46·1	28·4	32·7	31·6	87	10	trace	N.W.
23	·48	39·9	24·1	33·7	32·0	82	0	·03	N.W.
24	·65	34·1	21·5	25·4	25·1	92	3		N.E.
25	·74	35·9	23·7	31·4	31·0	93	10		N.E.
26	·91	30·1	17·8	28·7	28·0	88	10		N.E.
27	·91	36·4	19·3	25·2	25·2	100	8		W.
28	29·74	40·7	25·0	36·1	33·6	78	10		S.W.
29	30·00	45·9	27·9	35·4	33·3	81	10		S.W.
30	30·14	49·7	31·6	44·9	43·7	90	10	trace	S.E.
								Total	
Mean	30·06	48·7	34·4	42·2	41·0	91	8·4	1·63	
Mean for 22 years	29·96	49·5	37·2	43·6	42·5	92	8·1	2·52	

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DECEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·11	49·9	42·4	49·1	47·0	84	10		S.E.
2	29·80	49·9	40·2	46·1	45·1	92	10	·11	S.E.
3	·72	51·7	37·7	39·4	39·4	100	10	·02	S.E.
4	·79	53·7	38·8	51·7	50·3	90	10	·20	S.W.
5	·64	52·2	44·5	46·7	44·7	85	8	·42	W.
6	·44	46·4	40·4	46·1	46·1	100	10	·41	S.E.
7	·28	40·2	34·5	36·9	36·8	99	10	·11	S.E.
8	·63	38·9	32·1	34·1	33·0	88	10	·09	N.E.
9	·42	45·9	25·5	38·3	38·3	100	10	·16	S.E.
10	·28	43·2	38·0	41·9	41·9	100	10	·10	S.E.
11	29·65	45·4	26·9	30·1	29·2	85	8	·31	W.
12	28·95	47·1	28·9	41·4	40·7	95	3	·05	S.
13	29·53	42·1	35·3	40·9	39·4	87	10	·30	N.E.
14	·47	43·9	29·5	40·2	40·1	99	10	·10	S.W.
15	·68	52·9	36·3	41·4	41·1	98	10	·02	S.W.
16	29·91	55·9	42·0	52·4	51·7	95	10	trace	S.W.
17	30·18	55·1	51·2	52·9	50·8	86	10		S.W.
18	·29	53·2	49·6	52·4	50·7	88	10	·02	S.W.
19	·55	42·2	26·7	31·1	30·3	88	10	trace	N.
20	·47	36·9	30·4	34·9	34·8	99	10		N.E.
21	·39	31·4	22·5	29·4	29·3	98	10		N.E.
22	·34	31·9	21·5	26·4	26·1	97	10	·02	N.E.
23	·26	33·2	24·8	31·9	31·0	88	10	trace	N.E.
24	30·15	36·7	29·6	32·4	31·6	89	10		N.E.
25	29·98	39·9	32·1	36·1	36·0	99	10	trace	E.
26	29·93	37·9	28·6	34·9	34·0	90	10		N.E.
27	30·21	42·9	34·5	36·1	36·0	99	10		N.E.
28	·39	52·5	33·8	42·7	41·9	94	10	·02	N.E.
29	30·41	55·4	42·2	52·1	51·0	93	10	·02	N.
30	29·84	47·9	46·7	47·7	42·2	65	10		N.E.
31	30·25	42·1	33·6	38·7	36·4	81	10		N.E.
								Total	
Mean	29·90	45·1	34·9	40·5	39·6	92	9·4	2·48	
Mean for 22 years	29·91	44·2	33·0	38·6	37·7	91	8·2	2·36	

Total rainfall for the year, 23·45 in.
Mean for 22 years, 25·06 in.

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FIELD CLUB SECTION.

A fairly successful season has to be recorded, the numbers belonging to the Field Club were well up to the mark; some, however, fell off as the season advanced, the arduous task of keeping up note books being too much for them.

The high standard of those note books that were sent in at the end of the summer term proved that there were a certain number who really were doing some good and useful work, both in the way of natural history notes and in the photographic records.

Several of the members chose one out of the list of subjects posted as suggestions for a year's work, and this is just what everyone will find of great value, instead of doing indiscriminate work, and it is to be hoped that many others will avail themselves in future of the suggestions. The subjects were as follows:

Natural History.

1. Devices in plants to prevent the visits of undesirable insects.
2. The migratory birds of the district.
3. Local ants, bees, and wasps.
4. Local snails and slugs.
5. Spiders.
6. Caterpillars and their colouring, in relation to food plants (from a protective point of view).

Photographic.

1. The forms of Trees, both in and out of leaf.
2. The barks of trees.
3. Grasses, in flower if possible.
4. Clouds and cloud effects.
5. Domestic animals.
6. Fungus life.

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Most of the above subjects can be worked at throughout the year, and provided that not too many be attempted at once, a steady year's work will do a great deal to stimulate and increase the powers of observation and of drawing logical conclusions which are of such great value in after life.

There is very little to record of permanent interest, the season on the whole was a fair one; four excursions took place, the one to Strathfieldsaye had to be abandoned twice owing to the bad weather, but later on in the season it was successfully carried through.

A meeting was held in the Museum on Sunday, March 27th, when the following were elected as members of the Committee.

Director: REV. H. P. FITZGERALD.

Entomological Secretary: G. JEFFREYS.

Botanical Secretary: L. D. G. ALEXANDER.

General Secretary: J. P. G. WORLLEDGE.

EXCURSIONS.

An excursion to Strathfieldsaye was planned for May 21st, but owing to torrents of rain this had to be abandoned; a second attempt on May 28th was also a failure owing to the bad weather; it was, however, successfully carried out later on in the season, but as it was intended to be principally for the ornithologists, the main object was defeated; a pleasant day was spent over there, leaving the College at 1.30 p.m. in brakes and on bicycles, and we are indebted to Mr. and Mrs. North for a very plentiful and pleasant tea.

SATURDAY, JUNE 11TH.

A large party went by train to Shalford, and after having lunched at the "Sea Horse Inn," dispersed in all directions; the photographers were very much to the fore; there is nothing of very particular interest to record, although every one seemed to be pleased with the results of the day. The party reassembled at the inn for a capital tea and then returned by train.

SATURDAY, JUNE 25TH.

Puttenham Common was the objective, a locality which has every appearance of being an excellent hunting ground for all comers, but it did not come up to expectation, except to the

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botanists, who found several interesting and more or less uncommon plants, chiefly by the sides of the big pond at Puttenham Mill. After having lunched and waited in vain for the ginger beer, etc. (which turned up eventually, but too late for the majority), and having scoured the country well, we collected at Elstead and bathed in the river. A few bicycling geologists met us at "The Golden Fleece" at tea-time, after which we drove back to Ash station and trained home.

Saturday, July 9th.

We started for Hook Common at twelve o'clock, some in brakes, others on bicycles, and having lunched, dispersed in pursuit of White Admirals and Silver washed Fritillaries. There were a great many of these to be seen, but most of them managed successfully to escape being captured; the flight is rapid, the day was hot, these facts may account for it. Butter wood, however, is always pleasant and full of interest, and at the end of it Lady Dorchester's kind hospitality at tea was greatly appreciated.

H. PUREFOY FITZGERALD.

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PHOTOGRAPHIC SECTION.

1904.

RECEIPTS.

	£	s.	d.
Balance from 1903	7	9	10
Lent Term—Subscriptions	1	1	0
Entrance fees		16	0
Table sold		3	6
Easter Term—Entrance fees	1	15	0
Subscriptions	2	9	0
Michaelmas Term—Entrance fees		11	0
Subscriptions	1	19	0
	£16	4	4

EXPENDITURE.

	£	s.	d.
Lent Term—Dishes		5	0
Padlock		1	0
Key for Dark Room		1	0
Hypo for previous Term		6	6
Hypo		3	6
Glass		5	0
Cleaning		5	0
Easter Term—Towards lockers	2	5	0
Ruby Glass		2	2
Tap		3	6
Dishes		3	8
Cask (Attride)		10	6
Hypo		10	6
Cleaning		5	0
Glass		5	0
Michaelmas Term—Two lamps	1	6	0
Curtains		16	0
Hypo		5	3
Mantle			6
Cleaning		7	6
Glass		5	0
Balance	7	11	9
	£16	4	4

G. E. BLUNDELL.

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PHOTOGRAPHIC SECTION REPORT.

It had been felt by many that the five shilling entrance fee for joining the photographic section was too high, therefore at the beginning of the year it was decided to reduce it to one shilling, while retaining the same terminal subscription of a shilling. By these means it was hoped to secure such a large increase of members that the annual income would not be reduced. As a matter of fact, the result has been that the larger numbers at the smaller subscription have nearly trebled the receipts of the Section and thus the improvement in the accommodation of the dark room was soon rendered possible.

The popularity of small cameras and the ease of enlarging to any size from small negatives suggested the need of an enlarging lantern. The Natural Science Society was good enough to provide an excellent instrument which has been in continual use summer and winter since its purchase.

The natural result of the large membership was considerable overcrowding, especially at certain times. Towards the end of the summer term, the college authorities were approached and they decided on the extension of the dark room. This was carried out during the summer holidays, so that we now have a room more than twice as large as the old one, with the further advantage that one part is cut off from the other by a curtain, thus members can go in and out without waiting for the man in possession to hurry up his development.

The photographic work carried out by members has shown considerable enterprise both in method and subject; and it is satisfactory to be able to state that the straight up and down reproduction of the college buildings is becoming rarer, and is now almost confined to beginners and post cards.

Those who have taken up the difficult subject of natural history photography are becoming more numerous and more skilful, the competition for prizes in this subject being very keen. Hay ma. produced a remarkably good series of bird photographs which took the first prize, while Pain mi. won Mr. Longland's prize for photographs of birds' nests. Hay mi. Field, North and Hagreen should also be mentioned for their work in this direction.

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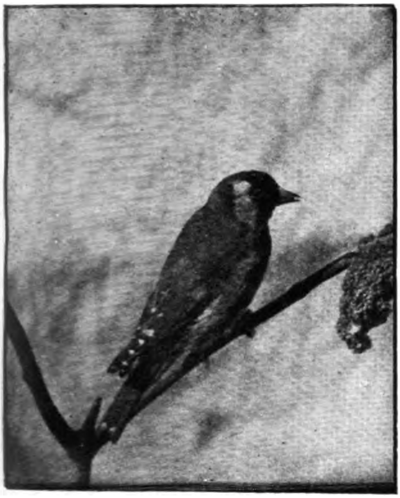
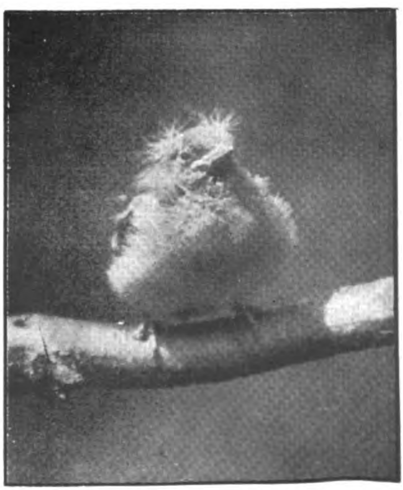


GOLDFINCH. *E. F. A. Hay.*

BLACKCAP. *J. H. Hay.*

COLE TIT. *E. F. A. Hay*



CHAFFINCH. *H. P. A. Haygreen.*

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In the Michaelmas term, Mr. Perkins kindly gave a prize for the best enlargements done during the term. This competition produced a very large entry, and the four or five of the best pictures were excellent. The prize was divided, Hay ma's 'Goldfinch' receiving the first, Heath's 'View from Paignton Pier' the second, and Hagreen's 'Castle Rising' the third prize.

The fact that the first prize in each of two competitions has been won by a member who specializes in one branch of photography, suggests that much might be done by others if they took up one definite line and made it their own.

G. E. BLUNDELL.

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THIRTY-SIXTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1905.

VIRTUTIS FORTUNA COMES

HEROUM FILII

"*Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης.*"
Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1906.

WISCONSIN ACADEMY
OF
SCIENCES, ARTS, AND LETTERS

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THIRTY-SIXTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1905.

HEROUM FILII

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."
Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1906.

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THE WELLINGTON COLLEGE PRESS:
PRINTED BY THOMAS HUNT.

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Contents.

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RULES.

—:o:—

1. That this Society be called the "WELLINGTON COLLEGE NATURAL SCIENCE SOCIETY."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That all Members of the School be eligible as Associates, and that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names, with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the numbers of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other benefactors.

18. That Members and Associates pay a subscription of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all Meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That tbe Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, a Field Club Section and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

PRESIDENT—S. A. SAUNDER, Esq.

VICE-PRESIDENTS { J. L. BEVIR, Esq., H. W. OWEN HAGREEN, Esq., REV H. P. FITZGERALD, G. E. BLUNDELL, Esq.

SECRETARY { R. S. WAHAB, R. E. PARSONS

TREASURER { J. P. G. WORLLEDGE, E. F. A. HAY

DIRECTOR OF THE PHOTOGRAPHIC SECTION—G. E. BLUNDELL, Esq.

SECRETARY OF THE PHOTOGRAPHIC SECTION—R. S. WAHAB

DIRECTOR OF THE FIELD CLUB SECTION—REV. H. P. FITZGERALD

SECRETARY OF THE FIELD CLUB SECTION—J. P. G. WORLLEDGE.

DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, Esq.

CORRESPONDING MEMBERS

THE DEAN OF LINCOLN
CAN. TRISTRAM, D.D., F.R.S.
PROF. RUPERT JONES, F.R.S.
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* Left Easter Term, 1905. † Left July, 1905. ‡ Left Christmas Term, 1905.

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Subscriptions:			
Lent Term—Honorary Members ...	4	2	6
Members and Associates	5	15	0
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Bursar, for use of Lantern, Gas, &c....	2	10	0
Sale of Report	9	0	0
Interest on Deposit	2	6	6
	£140	14	11

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	£	s.	d.
Gas, Limes, &c., for Lectures ...	5	18	5
Hire and Purchase of Slides	1	7	3
Expenses of Conversazione	3	1	8
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Hook, for reading Thermometers ...	2	0	0
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Prizes	2	0	0
Hunt, for printing Report	13	16	0
Morgan and Kidd, for illustrations for Report	2	4	0
Balance in hand	106	16	2
	£140	14	11

Examined and found correct,

December 18th, 1905. S. A. SAUNDER.

E. F. A. HAY, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 11th.

H. G. HART, ESQ., gave a lecture on "The Indian Mutiny." In view of the short time at his disposal Mr. Hart proposed to deal with his extensive subject by giving an account of the three great sieges of the Mutiny—the sieges of Delhi, Lucknow, and Cawnpore. The last of these three he said he would only just mention, and would then pass on to the stories of Delhi and Lucknow. The siege of Cawnpore had lasted for only three weeks, but in that short time our countrymen and countrywomen had displayed a heroism which was unsurpassed elsewhere during the Mutiny. After the fatal three weeks were over, General Wheeler, in spite of the warnings of Sir H. Lawrence, determined to ask for terms with Nana Sahib. After surrendering they were cruelly massacred. Thus it would have been better for them to die at their posts fighting for their country, than to be ignominiously slaughtered as prisoners of the enemy. Before giving the history of the siege of Delhi, the lecturer said he would dwell for a few minutes upon the causes of the outbreak of the Indian Mutiny. The real cause of the outbreak was the collision of Eastern and Western ideas: of course the natives were given the cartridges which probably had the grease of cows on them, but this was only the match which set the whole ablaze—*οὐ περὶ μικρῶν ἀλλ' ἐκ μικρῶν γίγνονται αἱ στάσεις*. Again it was not only a racial contest but a personal contest between British rulers and native princes. The laws of the English also interfered with national customs—a particular instance of this being the interference of the British, for good reasons, with the oriental custom of adopting children to inherit their property. By this the English made many enemies, not least among them Nana Sahib, who was the adopted son of the great chief of Poona. The land question was also a source of irritation, but above all there was the growing idea that we were trying to break down their caste. Perhaps caste does not at first sight seem much to us, but its loss to a Hindu meant disgrace in this world, and damnation in the world to come. The grease put on the cartridges was, they thought, an attack on their caste.

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As a matter of fact in January, 1857, we were introducing the Enfield rifle for which the cartridges had to be lubricated. This led to the outbreaks in March. On May 10th, a more serious disturbance took place at Meerut, some Dragoons refused to use the cartridges, and the offenders were put in irons before their comrades. Enraged at this, the native troops seized their opportunity when the Europeans were going to church, and revolted. Since then it has become the custom in India, for troops to appear armed on Church Parade. The first act of the mutineers was to liberate their comrades from prison, and they then turned to plunder and massacre. The commanding officer at Meerut was completely without presence of mind, and so allowed these mutineers to march unpursued to Delhi. Delhi was in the middle of a circular district which now broke out into revolt, and the Punjab was the only district that remained true. This was the more remarkable, as only eight years had elapsed since its conquest. On May 12th, the commander-in-chief, George Anson, heard of the news of Meerut at Simla, and he collected troops at Umbala: on May 26th however, he died of cholera, and was succeeded by Sir H. Barnard. The latter asked for troops from Meerut, and a force was assembled under General Archdale Wilson, 10 miles north of Delhi, on June 7th. On June 8th after a big engagement in which the British were successful, Barnard and Wilson managed to press forward and reach Delhi. Here they planted on the ridge which faced the city 3000 British troops, while in the city there were 30,000 men trained by ourselves, and 170 guns on the walls. The British were always being assailed in different places on the ridge. Owing to the suffering of the troops from heat and sickness, it was twice over settled to take the offensive and attack—on the 13th June and 3rd July: but, fortunately for the English, the assault was postponed on both occasions from different causes. On June 23rd, the enemy delivered a great attack. They believed that the English rule in India could only last 100 years, and that on the anniversary of Plassey, they were destined to deal its death-blow to our Indian Empire. The lecturer then described the arrival of John Nicholson with reinforcements, and finally the great British assault. One party was to attack the trench near the Cashmere Gate; a second was to deliver an assault on the Water Bastion. Another column was to wait till the Cashmere Gate was blown up and help to force an entry. A fourth column was directed to make an attack on the West, but this failed. A small body was held in reserve. The attack took place at sunrise on September the 14th, with the result that the Cashmere Gate was blown up and the city entered, with tremendous loss of

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life. Mr. Hart vividly described the wonderfully dramatic scenes of the assault. On the 21st the Royal Salute was fired, and the triumph of the English assured. A series of interesting photographs of Delhi, and of the chief points of interest in the siege was then shewn.

The siege of Lucknow happened considerably later than that of Delhi, and there it was the British force that was besieged. On the 30th June, 1857, the English were compelled to go inside the enclosure. The enclosure was about the same size as the piece included between the rhododendron avenue, the main drive as far as Mr. Toye's house, the main road and the road back to the College past the Gasworks. In this enclosure there were about 3000 souls, of whom 1300 were non-combatants. Sir H. Lawrence who, jndging from an article he wrote in the Calcutta Review in 1843, had foreseen the mutiny, with wonderful foresight had gradually fortified the place by a uniform process which prevented there being any specially weak spot. When an outbreak on the 30th May, was followed a month later by the news of the fall of Cawnpore, the inevitable happened, and a disastrous battle was fought. One of the English regiments, contrary to orders, entered the battle without having had breakfast, and altogether our troops were in disorder. On June 30th, the English were driven into the enclosure, and 48 hours afterwards, Lawrence died from the result of a shell which exploded in his bedroom. His death caused dismay, but he had inspired the troops, and on his death-bed he implored them not to give in. On July 20th, August 10th and September 5th, they resisted tremendous attacks, and after this test they felt confident. The engineers prevented the mines of the enemy taking effect by persistent countermining, and the natives soon saw that their task was now hopeless. Owing to the lateness of the hour the lecturer was prevented from carrying on the story of Lucknow to a conclusion, and from telling the dramatic story of its relief. The exhibition of more photographs, brought a most enjoyable and instructive lecture to a conclusion.

A vote of thanks to the lecturer was proposed by Mr. Purnell.

Saturday, February 25th.

The Rev. C. R. Carter gave a lecture on "Recent discoveries at Nineveh and Babylon."

Mr. Carter began by showing a map of the district between the Tigris and Euphrates where these discoveries have been made, and gave a description of its present general appearance

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and of the difficulties which explorers experience at the hands of superstitious and greedy Pashas. The method of mound building by slave labour was explained and the system of drainage. Slides were then shown of the different ways of burying and pictures of coffins found at Erech. The lecturer described the way in which the cuneiform letters were formed and the records of the past were written on bricks which were afterwards baked, and how the language was deciphered mainly through the exertion of Sir G. Rawlinson, Mr. G. Smith and others. The bricks were discovered by Sir H. Layard in the library of Ashurbanipal together with grammars, dictionaries, etc., of an older language, the Accadian, which at the time Ashurbanipal was preserved only for use in religious formulæ. The determining of dates was largely due to chance discoveries, *e.g.*, the statement made by Nabonidus that he had discovered the prism of the son of Sargon I (Accadian), placed under the foundation stone of his palace thrice a thousand twice a hundred years before. Pictures were also shown of the winged animals, the arts of war and peace, and some of the deities (the demon of the S.W. wind being especially obnoxious in form). Sargon, Sennacherib, and Ashurbanipal were shown on the screen, the latter engaged in his favourite lion hunting which was then the royal pastime. The lecture closed with a picture of the palace of Sennacherib (restored by Ferguson) and the reading of the prophecy of Isaiah on the destruction of Babylon.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, March 11th.

W. H. WAGSTAFF, ESQ., gave a lecture on "The Calendar and its Makers."

The difficulty in making a satisfactory Calendar arises from the fact that the year does not contain an exact number of days; when we say that there are 365 days in a year, we really ignore about six hours, or a quarter of a day. Julius Caesar was aware of this when he introduced the Calendar known after him as the Julian Calendar, in which every fourth year contains an extra day. Previous to his time a very unsatisfactory state of affairs had prevailed; the calendar-year was far too short and an extra month had to be inserted or "intercalated" occasionally in order to keep things straight; unfortunately too, the intercalation was not made on any regular principle, but on personal grounds, in order to prolong the period of office of the Pontiffs or their friends. When Caesar remedied this abuse he changed the name of the

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month 'Quintilis' into 'Julius,' after himself, and this name is of course perpetuated in our 'July.' He also arranged that the months should have alternately 31 and 30 days throughout the whole year, with the exception of February, which was to have 29 days, or 30 in leap year.

Caesar was assassinated before his leap-year scheme came into operation, and his directions were misunderstood by his successors, who arranged for leap year to occur once in every three years, instead of once in every four.

This error was corrected by Augustus, who thereupon conferred his own name on the month formerly known as Sextilis and increased the number of days in it from 30 to 31. To compensate for this, February was reduced to 28 days (29 in leap year), an arrangement which has continued unaltered ever since.

The Julian Calendar went on the assumption that the actual length of a year was 365 days, 6 hours; in reality it falls short of that time by about 11 mins. 14 secs., so that there is a gradually increasing error. It is easily shown that this error would in the course of about 128 years amount to a whole day. Pope Gregory XIII, towards the end of the 16th century, set to work to reform the Calendar, and it is to him that we owe the arrangement now in use, known as the Gregorian Calendar; he might well have made his correction date back to the beginning of our era, but as a matter of fact he only went back to the year 325 A.D. This was the date of the Council of Nice, when certain rules for the fixing of Easter were formulated. This required an alteration of 10 days and accordingly Gregory ordered 10 days to be dropped from the Calendar in the year 1582. It was alleged that miracles which took place on fixed dates adjusted themselves to the order, and the change was soon agreed to by Roman Catholics; but Protestants did not believe in the miracles at all, nor did they wish to obey an order issued by a Pope—consequently in England and other Protestant countries the change was not made, and Old Style (as it was called continued.) England did not adopt New Style till 1782, and even then the change was very much resented by the common people, who thought that they were robbed of eleven days.

Gregory XIII not only corrected the mistake, but he devised a system for ensuring greater accuracy in the future; his rule was that the Julian system should be followed except in the case of century years; these were not to be leap years unless their century numbers were divisible by four. Thus, of the years 1600, 1700, 1800, 1900, 2000, only 1600 and 2000 would be leap years. This keeps the calendar correct for over 3500

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years, and is the system now universally adopted throughout the civilised world except in Russia.

Many other methods have been devised: if a leap year were dropped from the Julian system every 128th year very great accuracy would be secured—in fact no further correction would be required for about 35,000 years.

A very good method is that which would drop the leap year of every century except the fifth, *e.g.*, making 2000, 2500, 3000, etc., leap years, but 2100, 2200, etc., ordinary years. This is just as simple as the Gregorian, and preserves accuracy for 4500 years. "Friar Bacon in 1267 urged Pope Clement IV to reform the Calendar on a plan equivalent to this; but he was put in prison for 10 years instead."

At the same time that the Calendar was reformed, the year was made to commence in January; it had previously commenced in March. This is apt to lead to mistakes in chronology, *e.g.*, the case of the execution of Charles I. The inscription on the Great Seal of the English Commonwealth reads: "In the first yeare of Freedome, by God's blessing restored 1648." The execution occurred in January, but January was then nearly the last month of 1648; we regard it as the first month of the following year, so that 1649 is the correct historical year.

The so-called Old Quarter Days are a relic of "Old Style;" and this is the reason why the first day of the financial year is April 5th, being Old Lady Day.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, March 25th.

W. H. Wright, Esq. gave a lecture on "The British Navy."

The lecture consisted of a historical sketch of the British Navy from its infancy to Trafalgar. The lecturer commenced by stating three propositions, and proceeded to illustrate them by allusions to historical naval events. The propositions were: First, that England as an island is peculiarly situated and is thus forced to depend upod the sea for her very existence; Secondly, that it is by her superiority upon the waters that she has won her present proud position; Thirdly, that no transmarine warfare can prove successful while there is a hostile potential fleet in existence. King Alfred was the originator of the maxim that the surest means of naval defence is to attack first, and not let yourself be attacked; and that has been the policy of the British Navy ever since. The Norman invasion must have been unsuccessful had not the sailors of

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Harold's fleet been disbanded in order to gather in the harvest: this was fully demonstrated by Hubert de Burgh when he destroyed the French fleet in the first real naval battle fought by an English fleet. Neglect of the lecturer's third proposition had led to the respective failures of the Armada, and the expeditions planned by Choiseul and Napoleon. Whilst the destruction of the Armada ensured the existence of England as a separate power, the subsequent contests with the Dutch and French led to England capturing the carrying trade of the former, and establishing her Colonial Empire in spite of the opposition of the latter. The lecturer next spoke of some famous battles and naval heroes, such as Blake, Howe, Rodney and Nelson. In conclusion slides were shewn illustrating the growth of the modern battleship and cruiser, and various matters of interest in connection with our own and foreign navies. The audience were reminded that, though their interests lay perhaps more in military than in naval lines, they must not overlook the moral pointed out by the lecturer, that the existence of a powerful navy is absolutely essential to the very existence of the Empire, and that therefore it is the duty of every citizen to see that, as far as he is able, he promotes this end. They were reminded of the existence of the Navy League; a society whose object it is to keep the interests of the Navy always before the eyes of the Empire, and as a non-political body to urge upon those in power the necessity of keeping the standard of the Navy.

A vote of thanks to the lecturer was proposed by the President.

Saturday, April 8th.

W. B. Croft, Esq., F.R.A.S., gave a lecture on "Waves of Light."

The lecturer began by saying that towards the close of the seventeenth century it was imagined by Huyghens that light must be propagated, not by corpuscles moving in straight lines, but by waves in a subtle elastic medium, which has been since called ether. This main fact was made certain early in the nineteenth century, by Young and Fresnel. When two waves of light from the same source are made to reach the same spot by different paths, it may happen that the crest of a wave which has come by one path arrives at the same instant as the hollow of that which has come by the other path, and in this case two lights make darkness, as the waves mutually destroy one another. There will always be, close at hand, a position where the waves work together, and produce increased light. There is really no destruction of energy, but re-distribution.

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In cases where the peculiar conditions allow the mutual action of the small waves to be observed, there are many curious phenomena. Several photographs of such effects were shown. The shadow of a round piece of metal has a bright spot of light at the centre: the shadow of a needle has a bright line: the central brightness is broader for a narrower obstacle, thus the points of needles seem to be cleft and to open outwards in the shadows.

Arago's experiment, which indicates that the velocity of the waves is less in glass that in air was described. This has been regarded as the crucial experiment in favour of the wave theory.

The consideration of waves indicates that a lens must form overlapping images of points, which are less than about 1/100,000th of an inch apart. Thus there seems to be a limit beyond which a microscope cannot go. Photographs were shown of the striations of a diatom, which is called amphipleuva pellucida. Also a copy was shown of Dr. Spitta's division of the lines into spots, which may be regarded as the ultimate resolution of a microscope. A few words were said with respect to the importance of these interference effects in telescopes. For a long time it has been said that the brilliant effects of butterflies are due to wave interference, but Mr. Croft considered that this has been an error; the colour is due to pigment; there are brilliant colours but no iridiscence or play of light. The scales of butterflies may be used experimentally to produce diffraction, but it is not possible to see these effects, when they are in their place on the insect's wing.

A vote of thanks to the lecturer was proposed by Mr. Blundell.

Saturday, May 27th.

The Rev. A. L. Giles gave a lecture on "Birds."

Mr. Giles began his lecture by asking his audience not to mind hearing an old story over again as what he was about to say was very old but had not lost any of its interest by being often repeated. He said that he hoped that those who collected eggs never employed boys to get them, as this led to the nests being robbed. To take one egg out of every four in order to make a collection was permissible, but they should always be procured by the collector himself. He said that if we were about to make a flying machine, we should naturally look for some very light material. So it is with birds. Even their bones are hollow, and they possess sacks or cells which they can fill with air and so render it easy for them to fly. The lecturer went on to say that there were three ways by

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which birds could be distinguished. First of all by their different modes of flying; for instance the woodpecker has an undulating motion, while the starling moves its wings rapidly at first and then glides along with its wings extended. Secondly they could be distinguished by their colours, and thirdly by their songs. He then described the best way to observe a bird. The clothes worn should be of a dark colour and no white collar should be showing. a cap should be worn. Great quietness and patience were essential. By lying quietly for some time under a hedge a good view of the birds could be obtained, as they would come quite close without any fear. Mr. Giles then showed some very interesting slides of birds and their nests, giving a short description of each.

He said that chaffinches were increasing in this country. They were very fine song birds, and preferred to live on waste land or moors. The spotted flycatchers came to this country about the second week in May, and it is a curious thing that they always return to the same place, and in some cases have been known to repair their old nest. It seems wonderful that such small birds as these should be able to find their route all the way from Africa to the exact spot where they built the year before. The green woodpecker is a bird which is thoroughly fitted for its work. It has a powerful beak with which it can peck at the trees, and has strong claws by means of which it is able to get a firm grip of their bark. They are, however, often driven out of their nests by starlings, and nothing will induce them to return again. The bullfinch is a most affectionate bird, and although he certainly does some harm, there is no doubt that he does also his share of good.

Nests of the ring ouzel, or the moor blackbird, are to be found on Yes Tor. Their nests are by no means easy to find. The bird itself may be recognised both by its colour and by a peculiar shriek which it gives on leaving its nest.

The next bird shown was a cuckoo. A curious fact about it is that although it is as big as a turtle dove it lays an egg no bigger than that of a sparrow. They never build nests of their own, but always take possession of some other bird's nest. They do not lay their eggs in the nest but on the ground and then remove them.

Mr. Giles showed several more slides of the birds themselves, including the tree creeper, white throat, buzzard, grey shrike, gulls and swans. Of these the buzzard is the most rare in this country, as any one that appears is almost invariably shot.

Some excellent slides of nests were next put upon the screen. The nests vary in their formatfon very much; some are very neat while others again are all loose and untidy.

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Some birds make deep nests while others build very shallow ones. The magpie even goes so far as to make a roof to his nest, which is usually composed of strong twigs covered with thorns. Perhaps the prettiest nest to be found is that of the reed warbler. It is a very small nest, but curiously enough it is a favourite resort for the cuckoo. The lecturer also showed photographs of the nests of robins, linnets, jays, wild duck (which is scarcely a nest at all), and several others.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, June 10th.

W. H. KENNETT, ESQ., gave a lecture on "Polarised Light."

Mr. Kennett began by giving the general theory of light, and explained how a wave can be propogated by transverse displacement of the ether. He went on to show that a ray of light which is reflected at a certain angle from the surface of glass will not pass through a parallel sheet of glass, but is entirely reflected, while the light which is transmitted through the glass will pass through a parallel sheet without any portion being reflected. The light thus reflected or transmitted has acquired a "one-sided" property to which the name "Polarisation" is applied. In a ray of ordinary light the displacement of the ether can be in any direction which is perpendicular to that of the ray, but when the light has been "polarised" the ether particle can only move backwards and forwards in one particular straight line.

Another method of "polarising" light is by means of doubly refracting crystals. This was illustrated on the screen by passing a narrow ray of light through a crystal of calcite. This produced two spots of light on the screen, each of which was formed by "polarised" light.

In order to separate one of these rays from the other Nicol invented a prism, known as 'Nicol's Prism." It is made by cutting a rhomb of calcite into two parts and cementing them together again with balsam. This ingenious arrangement causes one of the two rays to leave at the side, while the other is transmitted in a completely 'polarised' condition.

The particular form of calcite known as Iceland Spar is the only crystal suitable for making these prisms, and it can only be obtained from one pit in Iceland which is no longer workable. In consequence of this the price of the crystals has risen enormously.

Mr. Kennett then went on to give an explanation of the polariscope. Polarisation is produced by reflection from

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glass and the light is examined or "analysed" by means of a Nicol's Prism. When a thin sheet of mica, which is a doubly refracting substance, is placed in the polariscope a coloured image appears on the screen, even when the analyser is placed so as to extinguish the "polarised" light. When a piece of calcite was used as the analyser, there were two images formed, in complementary colours, which overlapped on the screen and formed white light. This was shown to be due to the retardation of one of the rays in the crystal and consequent interference.

The colours, produced on the screen by means of the Polariscope, when mica is used, differ according to the thickness of the mica, and several colours are produced at one time by having a piece of flaked mica. Designs of various kinds may be made by using mica of various thickness. Mr. Kennett showed several slides of this kind. Somewhat similar effects were then produced by compressing glass, thus indicating that double refraction was due to unsymmetrical structure of the crystals.

The lecturer then shewed some slides of rock-forming crystals in the polarising microscope, each crystal was quite distinct from the others, for instance in the slide of granite, the quartz, mica, and felspar could all be seen.

A vote of thanks to the lecturer was proposed by Mr. Rogers.

Saturday, July 1st.

A Conversazione was held in the Drawing School. The many exhibits were of a varied and highly interesting character. On entering, the first thing that struck the eye was an excellent collection of Japanese curios, kindly lent for the occasion, by the Rev. A. Lea and H. Awdry, Esq. In a corner a Foucault's pendulum, demonstrating the rotation of the earth about its axis, was under the charge of Mr. Stocken. A little further on, Mr. Hardcastle caused much amusement by means of a small rotating platform on which the victim stood holding a pair of heavy dumbells in his hands. When his arms were stretched out, his motion almost ceased, and when he again lowered them to his side, his angular velocity rapidly accelerated, occasionally to his discomfort. Mr. Blundell, by means of a lantern with a polariscope attachment, illustrated the growth of crystals from an aqueous solution. The colour effect produced by the polariscope (which had been described in a previous lecture) was very beautiful. Mr. Lemmey showed the rapid growth of crystals of organic substances, such as naphthaline, chlorol, thymol, and phenol.

These he obtained by cooling the melted substances on a block of ice, and when a small fragment of a crystal of the same substance was placed in the liquid, other crystals could easily be seen growing round this nucleus.

Another interesting exhibit was a system of wireless telegraphy on the Lodge principle, with transmitting and receiving stations made entirely by A. S. C. Trench, a member of the school.

A Potter's wheel gathered round it a large crowd of spectators. The potter produced various designs of plates and vases at lightning speed and with great symmetry of form.

Mr. Roundell showed a sphygmograph, an instrument by which a graph of the beats of the pulse could be traced on a strip of smoked paper which was afterwards fixed in ether.

Other exhibits included a series of excellent photographs of birds and their nests, a collection of butterflies and moths and beetles, some large scale photographs of the surface of the moon, and a collection illustrative of the various types and dies used by printers from earliest times. Round one side of the room was hung a copy of Bayeux tapestry.

Mr. Eustace repeated some of Professor Osborne Reynolds' experiments shewing the apparently paradoxical effects produced by pressure upon a heap of sand in which the grains are arranged in normal piling.

In an adjoining classroom Mr. FitzGerald gave a demonstration of liquid air, which was repeated several times during the evening. He reminded his audience that chlorine and carbon dioxide had been liquefied by Faraday in 1823, hydrogen by Dewar in 1898. After describing the process by which the liquefaction is effected, he performed a number of interesting experiments. When liquid air is poured into a cool glass vessel it boils, apparently giving off clouds of steam, the effect being really due to the condensation of moisture in the atmosphere. A spiral of lead wire placed in liquid air became hard enough to support a heavy weight. Flowers immersed in the liquid became quite brittle, as did also an india-rubber ball. Whisky was frozen and mercury solidified into a hammer head, hard enough to drive a nail into a piece of wood. Charcoal became red hot, and solid carbon dioxide was formed.

Saturday, July 15th.

S. A. Saunder, Esq., gave a lecture on "Eclipses."

The lecturer first pointed out that as there were to be eclipses of the moon and sun on the 15th and 30th of August respectively, he thought it was a very good opportunity of giving a lecture on this subject.

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He began by showing some slides illustrating the phases of the moon, and how eclipses were possible. An eclipse of the sun is only possible at new moon, whereas one of the moon is only possible at full moon. One great difference between total eclipses of the sun and moon is that whereas the former are visible only over a small strip of the earth's surface, the latter can be seen all over the hemisphere which is turned to the moon. The strip in the case of the sun is for a total eclipse at the most 170 miles wide and usually only about 100. A partial eclipse of the sun is, however, visible over a larger area. He went on to explain the Saros or 18 year period of eclipses. He illustrated them by means of the following table:

1 synodic or lunar month = 29 days, 13 hours.

1 eclipse year = 346 days, 15 hours.

Whence it follows that

223 synodic months = 6585 days, 8 hours.

19 eclipse years = 6585 days, 19 hours.

These two periods nearly coincide and each is almost equal to eighteen years. From this it will be seen that eclipses will occur again at nearly the same seasons of the year after an interval of eighteen years, but in the case of solar eclipses, owing to the rotation of the earth, they will only occur in the same longitudes after 54 years, and then the latitude will have altered. Early astronomers observed this law and by it could predict eclipses of the moon.

The lecturer then proceeded to show how the eclipses in 1887 and 1888 correspond to those in 1905 and 1906, and mentioned some of the difficulties which arise in trying to predict eclipses.

After touching on eclipses of the moon and explaining the umbra and penumbra, he stated that a total eclipse of the moon was a useful time for measuring the position of the moon.

He next proceeded to give some idea of the size of the sun. Inside the sun there is room for the earth and the whole of the moon's orbit and there would still be a good deal to spare. Very little is known of the interior of the sun, except that it is exceedingly hot. Round this interior portion is a layer of cloud composed of small drops of substances very hard to fuse, such as carbon, boron and silicon; this is called the photosphere and is the part that we ordinarily see. Outside this again is a layer of metals in a state of vapour, forming the reversing layer. Beyond this is the chromosphere composed chiefly of hydrogen. Another part of the sun is the corona which extends for a great distance all round, and which till recently has only been visible during total eclipses. However, a short time ago, a report

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was made to the effect that it had been photographed from the top of Mont Blanc. Astronomers are now anxiously waiting for some confirmation of this.

The lecturer then showed some slides of sun spots, which occur in the photosphere. An increase and decrease in the number of sun spots occurs at more or less regular periods of about eleven years. The shape of the corona seems also to vary in the same period. By observing sun spots it has been discovered that whereas at the equator the sun revolves in twenty-five days, at latitude 40° it takes fully two days longer.

Next the lecturer explained spectra and spectroscopes, and how the elements on the sun are determined by means of them. He then shewed some slides ot solar prominences which occur in the chromosphere and which are seen best during total eclipses, though they can be seen at other times by means of powerful spectroscopes. In one set of photographs a prominence was seen to shoot up two hundred and eighty thousand miles at an average rate of 100 miles per second. Next were shown some slides representing drawings and photographs of the corona, and it was shown how two people at the same place made totally different drawings of it, illustrating the immense difficulty in obtaining exact representations. The lecturer concluded with some slides of appliances used in photographing the sun during total eclipses.

Mr. Blundell then proposed a vote of thanks to the lecturer.

Saturday, October 7th.

Dr. J. B. Hurry gave a lecture on "Reading Abbey."

Dr. Hurry began his lecture by telling how eight black-robed monks halted at Reading in 1121. They had come from Cluny, one of the chief centres of the Christian World, at the bidding of Henry Beauclerc, to raise the Benedictine Abbey of Reading. In those days, Reading or "Radingia," as it was then called, was a mere hamlet of some 30 one-storied hovels.

First they built a temporary lodging, with a little oratory, where God's blessing on their work was daily asked. Then, the site having been staked out, the building began on a princely scale. The Abbey consisted of a group of buildings clustering about a great church and enclosed by a massive wall on three sides and the Kennet on the fourth. The principal building was the splendid cruciform church, only 50 feet less in length than St. Paul's, and of Norman Style; but of this, unfortunately, only some crumbling, ivy-clad ruins remain. The cloisters formed the principal dwelling place of the Abbey; here the monks read, carried on business, taught

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novices, and practised their chants; here, too, they illuminated and kept their manuscripts. At the north end of the East cloister was the Abbot's seat, in the West cloister were located the junior monks. In the south wall of the cloisters was the entrance to the refectory, a long dining hall, with two long tables and a high table, the "mensa major," for the Abbot at the East end. On the south side was a pulpit from which a monk read from some holy book to the brethren at meals, during which strict silence was preserved. On the east side of the cloisters was the Chapter house; marks in the wall corresponding to the benches on which the monks sat may still be seen. South of the Chapter House was placed the dormitory where the monks slept: their rule enjoined them to sleep clothed and girded with ropes, so as to be able to rise at once for the midnight service. Next was the Hospitium, or guest house, a very important part of the Abbey, as Reading was on one of the great arteries of traffic of those days and hospitality was specially enjoined in the Foundation Charter; the Hospitium was so placed that the guests might not interfere with the religious services and routine of the Abbey. Before many years the Hospitium was too small for the crowds of travellers and wayfarers, so one of the Abbots decided to build a new and much larger guest house. A visitor was usually allowed hospitality for two days and nights and was expected to depart after dinner on the third day; if he wished to prolong his stay, special leave had to be obtained. The visitor was expected to rise for mattins and follow the exercises of the community.

Another charitable institution was the Leper Hospital. The lepers, who were very numerous in those days, wore a special dress and carried clappers to give warning of their approach; they were not allowed to touch a healthy person, or even to eat and drink with them.

The Abbey was not complete when its first charter was granted in 1125: the leper hospital was not built till 1134: even the Abbey Church was not ready for its "Hallowing" until 1164, when the ceremony was performed by Thomas à Becket in the presence of King Henry II. Abbot Hugh II erected an enlarged Hospitium between 1189 and 1195 to replace the old and smaller one. Doubtless minor changes were made in the church and buildings, but so great has been the destruction that all traces of them have disappeared.

At the head of this great monastery was an Abbot, who had a seat in the House of Lords as a peer of the realm and took part in State pageants. Within the Abbey he had complete control and exacted strict obedience; he appointed the inferior officers, presided at the daily gathering of the brethren in the

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chapter house and allotted to each monk his share of work. He had special rooms assigned to him, where he lived in princely style and entertained some of the highest dignitaries in Church and State. Outside the Abbey, he had extensive jurisdiction over Reading and the neighbouring district. All the trade and property of the villagers of Reading was under the control of the Abbey at whose gates they dwelt. They could plough and reap their own strips of land only in consideration for services rendered to the Abbot. In a word, the Abbey claimed civil as well as spiritual supremacy. The villagers struggled long and bitterly for liberty from this yoke for more than 200 years, but not until the dissolution, when the last Abbot was gibbeted before his own Abbey gate, were the burghers released from the grip of their feudal lord.

The monks themselves varied in number from 50 to 200; they wore a loose black tunic and a cowl ending in a point, and shoes and stockings. Their vows bound them to poverty; all necessaries were supplied from the common store. A large portion of the day was spent in the open air of the cloisters. They adjourned to church seven times a day, and were roused at midnight to attend an hour's service, after which they returned to bed. At day-break they had another service, and then came the "mixtum," or breakfast, of bread and wine or beer. After breakfast they all met in the chapter house, where penalties were exacted for breaking rules. Then followed the principal service of the day, High Mass or "Magna Missa," and at its conclusion, dinner in the refectory. During meals strict silence was observed, while the reader for the week read the Scripture or some other suitable book. After dinner came a short service, succeeded by an interval for reading or work. Vespers formed the sixth service of the day, and after them came supper. The last conventual act of the day was the service called compline, after which the brethren passed to the dormitory, each being sprinkled with holy water as he went out.

Dr. Hurry went on to recount the history of the Abbey, mentioning some of the most important events which took place in or in connection with it. Few religious houses had been so favoured by the Sovereign or selected for so many great functions.

Finally, Dr. Hurry described the dramatic fall of the Abbey from its greatness to the shame of seeing its last Abbot gibbeted before its very gates, quoting the words of Napoleon to the inhabitants of Cluny, so applicable to this incident, "You allowed your grand and beautiful Abbey to be sold and destroyed: Allez, vous êtes des Vandales."

A vote of thanks to the lecturer was proposed by Mr. Armstrong.

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Saturday, October 21st.

O. A. Shrubsole, Esq., F.S.S., gave a lecture on "Early man in Berkshire."

The lecturer introduced his subject by saying that although in most books of English History, the history of this country seemed to begin with Julius Caesar, yet he would take us beyond these times, since a very great deal may be known about prehistoric times. A progressive savage always has a history, and we were once progressive savages and had a very interesting history.

How do we get this information? By what is called "spade-work." This work has enormously extended our knowledge in Egypt and Chaldea, and splendid results have been obtained by scientific spade-work in our own country and district. The question arises, where shall we put the spade in the ground in order to find traces of man? Nowhere where there is sand or clay, since these represent marine conditions, and man is not marine; but on the hills and ridges we find gravel and here it is advisable to put the spade in; and this is done for us, since much gravel is excavated as metal for roads, and so the work of exploration is saved and the same result is gained; many valuable stones and tools are found.

What went on in those days? The rivers marked out their courses, excavated valleys, and left gravel on the slopes, so that what at one time formed a low-level deposit, became by subsequent erosion comparatively high ground. But why should these tools exist in gravel? Simply because the gravel coincides in age with man and his tools, which were almost all made of flint.

In those days the mammoth, the rhinoceros and other animals existed here, so man had to have some sort of a tool to defend himself with; and man was an animal of prey, as we are indeed nowadays. He caught animals very often in pit-falls or knocked them on the head, and perhaps he often got knocked on the head himself.

Only one skull of an early Briton has been found in England. It is of a low but not degraded type. Other remains of the older stone-age indicated shortness of stature, but enormous strength. In those days they probably in summer at least never dressed, except perhaps for some feast as we dress for dinner.

The question arises, why are the remains of man always associated with rivers? The solution is that towns always go with rivers. Ancient rivers had a very broad and shallow bed, so that in summer a river did not occupy all its bed, and so formed a highway for men and a reservoir of water. We find

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that some tools were thrown away to be brought into use again, and these are in many cases rechipped, giving us the work of two ages. But after long ages man got tired of the same form of flint tool, besides the stock of that material diminished greatly, so man altered the form of his tool. He began to have more requirements—civilisation always increases these—so he began more to want something to cut out a canoe than to pierce the skull of an animal, and he changed the form of his tool from a point to an edge. He not only made stone but also wooden tools, but all these have perished, so it is necessary to be content with finding the almost imperishable stone.

But how long were our fathers content with stone? They gave it up when something better, in the shape of metal, was found. It is unlikely that bronze was discovered in this country, probably it was imported. By the use of metal a tremendous stride was made, so much can be done with it which impossible with stone. It extended man's knowledge by giving him more leisure. It facilitated agriculture, as for instance, in the cutting down of trees. This metal-period brings us down to within 500 years of Caesar.

The growth of ideas at this later period is also strongly accentuated in the pottery. The pottery itself indicates advance, and the way in which urns for the ashes of the dead were decorated for the purpose of pleasing the spirits of the dead indicates religious ideas.

In Sunningdale twenty-five urns were found in one barrow, probably a village cemetery. Among these were two or three bigger than the others, so it was surmised that the "big pots" were buried in big pots. Mr. Shrubsole concluded his very interesting lecture by showing some lantern-slides, illustrating many of the tools of early times, the only skull of older prehistoric age found in England, and many more interesting things, including the skeleton of a mammoth.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, November 11th.

J. A. Hardcastle, Esq., F.R.A.S., gave a lecture on "The Planet Mars."

Mr. Hardcastle said that in thinking over the things of interest in Mars he was reminded of Alice in Wonderland where the things they drew all began with "m," for everything in connexion with Mars, including its name, begins with "m" —as its movements, markings and moons. As regards its movements, the first slide showed the positions of Mars and

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the Earth, at recent "Oppositions of Mars," and it was easily seen that on those occasions Mars was in every way most favourably placed for observation. The old astronomers accounted for its apparent "retrograde" movement at opposition by supposing it fixed at the end of an arm which revolved round the extremity of a radius which in its turn was pivoted at the Earth. Copernicus' explanation was made clear by a simple diagram. In Gulliver's travels it was stated that Mars had two moons, and this prophecy was just two hundred years too soon. He has two moons called Phobos and Deimos, which are 16000 and 6000 miles from the centre of Mars and are very small. Phobos is much nearer when overhead to a Martian observer than when on the horizon and therefore appears larger; he is invisible from the Poles. Very curious phenomena must be witnessed from Mars as these two moons pass each other in the sky; one may eclipse the other on the way. One really sees very little of the markings on Mars; but a very prominent feature is the two white patches which often occur and sometimes seem to project; these are probably patches of snow or something similar at the North and South Poles and are called Polar caps. Mars has seasons just as we have, and in summer the caps seem to grow smaller, probably indicating the melting of the substance, and in winter they seem to grow larger and are brilliantly white. But most other markings are very vague. There are permanent dark markings which are taken to be seas and bright markings probably land; by these we can ascertain fairly accurately how often Mars revolves. Mars always shows phases to a small extent and often there are pieces not illuminated. Details on Mars are very hard to observe, since most of what is seen is hazy, but in most drawings a noticeable feature is an elongated sea, also a forked bay which acts as the Greenwich of Mars from which other things are measured. In 1877, M. Schiaparelli said he had discovered what he, in Italian, called "canali" or water-courses; this was unfortunately translated canals in English thus giving rise to many absurd ideas. At one time it was said that signs were being made from Mars, but if they wished to wave to us, it would take a flag almost as big as Ireland to be seen: also a man professed that he had received a message that he could not understand, on his wireless telegraphic apparatus, and supposed it to be from Mars: the most probable message, if one came at all would be "Are you there?" It was a curious fact that as soon as Schiaparelli discovered these canals, everybody saw them, although they had been observing Mars before and had not noticed them, till matters grew to an absurd pitch. These canals were often seen double, parallel like lines. But at last a reaction set in among astronomers. The canals

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might be optical illusions; this idea was furthered by the discovery by Mr. Maunder that when he looked at a drawing, his eye drew in black lines that were not in reality there. This was further supported by the following experiment. A drawing rather like a chart of Mars was procured, and a lot of boys, without being told what it was or what they were doing, were told to sit down and draw a copy of this; they were seated in a hall, some near and some far away from the map which was hung up. Strangely enough one of the nearest boys put in a canal, which was not on the chart; and so did a second; and still stranger, these canals were almost identical in position and shape with those observed by astronomers, although the boys had never heard of such a thing as a canal on Mars. Again another boy seated further off showed canals all over the place, agreeing always with those of Schiaparelli; and yet another boy drew a double canal. So to sum up, we must not assume that nothing is there, but what is there is just too faint for the human eye to see, but the eye has a way of filling them in. But at last the canals were photographed, showing that they cannot be optical illusions. In conclusion the lecturer showed us four of the best drawings of Mars ever made; they were drawn by Professor Barnard, who is reputed to have the best eyes in the astronomical world and uses the best telescope in the world; but even he saw no canals, so for the present this question must remain unsolved.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, November 25th.

Capt. H. N. Kempthorne gave a lecture on "Northern Nigeria."

Nigeria consists of a large track of land on the West Coast of Africa, lying between Lagos and the Camaroons, and extending inland up the valley of the Niger and its great tributary the Benue, as far as Lake Chad. Its size is about three times that of the British Isles. The coast line is low and covered with vegetation, while further inland there are plateaus with dense forests, portions of which are under cultivation. Going still further inland a park-like country is reached, which extends as far as the Great Desert.

At the beginning of the last century the country was comparatively unknown, but its river, the Niger, attracted explorers and discoverers. Organised expeditions were sent from Cairo, from Tripoli and from Gambia. In 1805 Park set out from Gambia, and while going by boat down the Niger, was drowned in some rapids near Bussa. He was followed in 1830 by Lander, who went by land to Bussa, and

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thence followed the Niger down to its mouth, thus proving that it did not flow into the Nile, as was then generally supposed. Twenty years later Dr. Barth set out from Tripoli, and made further important discoveries. In 1886 the Royal Niger Company was started, and traded with the tribes on both sides of the river until 1899, when, in consequence of difficulties with France, the Government took over the whole country.

The inhabitants near the coast line were mostly cannibals, whilst those living in the interior were Mohammedans. The country was formerly in the possession of the Haussas, but these were overcome by the Fulani, a shepherd people who possibly came from Egypt. For the most part they intermarried with the Haussas, but a small section have refused to intermingle with other races.

The Country is divided into provinces, each ruled by a king supervised by a British Resident. As far as possible the Government is carried on through the Fulani, who are an extremely intelligent race. Slavery still exists in two forms; there are domestic slaves and slaves captured in war. The former are well treated and up to the present are tolerated. The latter fare worse being sold to traders who carry them all over the country. This form of slavery is being abolished.

An officer going on Service in Nigeria embarks at Liverpool, and after a voyage of eighteen days reaches the mouth of the Niger where he is transferred to a small Government steamer, in which he spends two days passing up the Delta, and then emerges into the main stream. There are a few villages on the banks of the river the inhabitants of which grow cotton, out of which they make their clothes, and cultivate enormous melons, which, when hollowed out, serve as cooking utensils.

In a few days time the steamer arrives at Lakoja, an important Government Station at the junction of the Niger and the Benue. It contains a church, a hospital, and a polo ground. The same steamer carries him on to a place twenty-two miles from Zungeru, which he reaches by the only railway in Nigeria. The country around this town was desolate until four years ago, when it was repopulated, a simple operation as the houses are made of grass and easily erected. After spending perhaps two months at Zungeru he starts for Kano, accompanied by a dozen carriers with all the necessary stores. He passes through Zaria, which in consequence of its central position, will probably be the future head quarters of the Administration, three days later he arrives at Kano, the largest commercial centre in the country. The town which was captured in 1903, is surrounded by a wall 30 feet high with eleven gates. The town is so large that it takes an hour

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to ride through it, and the palace is situated in a large compound a mile in circumference. After a few days at Kano he embarks upon the last stage of his journey, in which bullocks and camels take the place of the native carriers, and ultimately reaches Katagum, a frontier station ten days' march from Lake Chad.

In out stations a company is always kept ready to march at a few hours' notice. When a chief shows signs of giving trouble, this company is despatched, and if the commanding officer cannot bring the chief to terms by peaceful means the town is attacked. When a town is about to be attacked the natives usually make an advance with their cavalry, who being driven back seek shelter within the walls. The town is then stormed and burnt.

A vote of thanks to the lecturer was proposed by Mr. Collett.

Saturday, December 9th.

H. Awdry, Esq., gave a lecture on "Stories and Pictures from Egypt and Palestine."

Commencing with the picture of six geese whose drawing is perfect and their colours perfectly preserved, and following this with the well known figure known as "the Village Skeikh," a statue of the Clerk of the Works of the Great Pyramid of Cheops, date about 3700 B.C., the lecturer explained that these excellent works of art were far older than the flat stiff sculptures which we usually associate with Egypt, and that since those very early days Egyptian art did not advance but retrograded.

He then showed slides of the Sphinx, who is 60 feet high, *i.e.*, about the height of the tower above the Hardinge; and followed it by slides of the Pyramids, the Step-pyramids of Sakkara in the midst of the vast Cemetery of Memphis, and the Great Pyramids of Cheops and Chepren. The Pyramid of Cheops, now 460 ft. high, was once 480; and if you stood College Tower on the top of the Dome of St. Paul's this Pyramid would have shown 20 ft. above it. It covers 255 yds. square, *i.e.*, from the railings of the Science School to 30 yds. from the Shop, and from the path by the dormitory nets to the deodars along the Avenue. Its materials laid in a line of blocks of a cubic foot apiece would reach 17000 miles, *i.e.*, threequarters of the way round the Earth.

Abraham went down into Egypt about 1900 B.C., and therefore these mighty works looked as old to him as a monument of our Lord's time would look to us.

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Turning next to the history of Abraham the lecturer showed views of travelling on camels as he must have travelled, and of Bedouin tents such as he must have used; he followed him to Palestine and showed views of the terebinth of Mamre, on the site of the grove where he camped near Mamre; of the Dead Sea where stood the cities of Sodom and Gomorrah, Lot's home; and of the Mosque of Hebron covering the cave of Macpelah, Abraham's first possession and place of burial.

Mentioning next the coming up of the Israelites from Egypt, he showed several slides of the Jordan with its three successive pairs of banks, and explained where the priests with the ark must have stood while the people passed over. He followed this by a view of Old Testament Jericho and ended the Old Testament part of the lecture by a slide of the valley of Achor where Achan was stoned.

The New Testament portion commenced with our Lord's last journey from Jericho to Jerusalem; and the lecturer showed a Palestine beggar to illustrate Blind Bartimæus, and the point from which the sight of Herod's Palace at Jericho must have suggested the incidents of the Parable of the Pounds; also the caves near the robber-infested road up to Jerusalem, where Our Lord placed His Parable of the Good Samaritan.

Then came a description of the Triumphal Entry, with the view from the corner of the Bethany road where Our Lord wept over Jerusalem; and after this the huge stones of which the Jerusalem of that day was built.

Next came slides of the Temple Court in its present condition with the glorious Octagonal Mosque of Omar covering the celebrated "Rock" on the very summit of Mount Moriah, which Rock is perhaps the base of Solomon's Brazen Altar of Burnt Offering, standing just outside the Eastern end of the Temple, on the site which David chose,—the site of the threshing floor of Araunah the Jebusite.

Ending his lecture with the Passion he showed the Mount of Olives, the Olive Groves of the Kedron Valley, the Garden of Gethsemane where Our Lord was arrested, St. Stephen's Gate close to which stood the ancient gate through which he must have passed into the city, the Via Dolorosa to which that gate leads, and in it the sites of the Castle of Antonia the Roman Headquarters in Jerusalem, and of Pilate's Prætorium. Lastly he showed "Gordon's Calvary," a low hill 200 yards outside the Damascus Gate, the northern gate of Jerusalem, (1) "nigh to the city," but not so nigh that the crowds in the gateway witnessing the execution would prevent men knowing that Simon the Cyrenian was "coming out of the country" not out of the city; (2) conspicuous, so that the women could

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"stand afar off beholding"; (3) by the side of the great northern road, so that there would be "passers by, who reviled him, wagging their heads,"; (4) in a suburb of rich men's gardens with rock-hewn tombs, one of which tombs with the mark of a stone not less than seven or eight feet high, too great for the women to "roll away," is not 30 yards from the hill. And on the face of that hill as seen from the Damascus Gate, there is the extraordinary phenomenon of a natural arrangement of caves and rock-strata giving it all the appearance of a death's head, a circumstance which would have accounted for the name Golgoltha; and we find that in St. Luke the Revised Version reads not "they led him unto a place which is called 'the place of a skull'" but "they led him unto a place which is called 'the skull,'"—evidently a description of the appearance of the place. It is at any rate a most remarkable coincidence that on a spot that in every respect suits the circumstances of the crucifixion "a skull" appearance upon the rock should be found; and this though it *proves* nothing makes "Gordon's Calvary" a formidable rival to the traditional site of the Crucifixion and Burial within the "Church of the Holy Sepulchre."

A vote of thanks to the lecturer was proposed by the President.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Friday, February 3rd.

At a P.B.M., votes of thanks were passed to A. S. G. Kennard and F. H. Huleatt, the retiring Secretary and Treasurer.

R. S. Wahab was elected Secretary.

J. P. G. Worlledge was elected Treasurer.

R. St. C. Talboys, Esq., E. M. Eustace, Esq., C. A. Stocken, Esq., G. Jenner, Esq., were elected Honorary Members.

J. Hunter Blair, S. R. C. Plimsoll, J. F. P. Butler, C. W. R. Tuke, I. K. Thomson, H. R. Pollock, W. H. Croome, F. G. G. Willoughby, R. V. Montgomery, O. H. Tidbury, G. Le Q. Martel, R. F. Miller, J. L. C. Mercer, A. C. Sykes, J. C. W. Francis, D. A. L. Davidson, L. B. Paget, G. J. Kincaid Smith, H. A. W. Pearse, H. A. Garstin, W. C. Wilson, R. C. C. Liston, T. M. Pulman, E. V. B. Levinge, J. C. F. Davidson, N. F. Barton, T. C. R. Anstey, C. A. Fenwick, L. Coker, E. S. M. Prinsep, R. W. Henderson, E. J. Bannatyne, R. V. Burke, L. S. Bell Syer, G. C. Bampfield, P. J. Whitelocke LLoyd, C. F. L. Stevens, R. Gough, R. M. Slater, F. G. Wheler, were elected Associates.

The President gave notice that he would move to omit the words "pay a subscription of 1s. 6d." in Rule 18, and to insert "pay a subscription" after "Associates" in the same Rule.

At a Committee Meeting, M. F. Grove White, R. S. Wahab, R. A. Peters, A. V. Olphert, W. E. Pain, were elected Members.

Monday, February 20th.

At a P.B.M., A. R. Hoffman, G. W. Sherston, J. W. Ebden, E. L. G. N. Grell, L. R. Darwen, C. Wildman Lushington, R. D. Robertson, were elected Associates.

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The motion for the change in Rule 18, of which notice had been given at the previous meeting, was proposed by the President and carried unanimously.

At a Committee Meeting, L. D. G. Alexander was elected a Member.

Wednesday, May 24th.

At a P.B.M., H. E. F. Craddock, V. H. Seymour, F. C. Baker, P. K. Bonlnois, A. C. Tod, G. S. Harris, C. T. A. Pollock, A. L. Auchinleck, H. C. Read, W. H. Carew, W. M, Fowle, L. Jones Bateman, H. R. L. Lawrence, F. N. Lane. A. J. Usborne, W. A. P. Foster, F. A. H. Castberg, E. L. Kidd, A. L. de Cordes, A. S. C. Trench, J. A. Jervois, H. S. Pinder, C. A. Stevenson, A. N. Cahusac, A. W. Turner, A. G. O. M. Mayne, H. S. I. Pearson, H. W. Crippin, H. F. P. Bivar, R. A. Mackean, B. A. D. Kinahan, C. G. Y. Skipwith, W. F. Heyland, R. G. A. Thorne, V. J. H. Elliott, C. G. Parker, A. S. Allen, R. H. Peters, G. F. Griffith, Hon. A. P. Methuen, C. Sykes Banks, R. Sykes Banks, N. R. Daniell, J. H. Stafford, R. H. Broome, W. B. Loveless, V. E. Guinness, I. B. M. Hamilton, K. F. P. Mackenzie, E. P. F. Schweder, G. O. Simpson, L. Errington, E. J. Howard, H. M. Heyland, D. Wynyard, C. Coles, R. F. A. Gavin, H.H. Prince Maurice of Battenberg, R. H. P. Broome, G. D. G. Elton, M. L. Loveless, G. J. Jameson, R. A. H. Lewin, P. R. Hughes, K. F. W. Dunn, C. C. K. Campbell, G. A. K. Lawrence, R. T. Lawrence, D. C. D. Potts, D. B. Mackintosh, M. S. Close, J. R. Wilton, F. R. Eustace, J. H. Martin, D. R. Turnbull, R. G. Cazalet, were elected associates.

At a Committee Meeting, S. R. Wason was elected a Member.

R. S. Wahab and J. P. G. Worlledge were elected Judges for the Pender Prize.

Tuesday, October 3rd.

At a P.B.M., R. E. Parsons, H. E. C. Beaver, H. P. Pollock, J. S. Sampson, N. H. T. FitzRoy, M. G. R. Willoughby, G. C. C. Strange, J. H. E. Shearme, F. W. Crosse, H. W. B. Foster, K. C. McPherson, J. W. Battersby, W. Scott Moncrieff, M. A. Capron, M. I. H. Anwyl, C. H. L. E. West, C. W. Hooper, L. A. Barrett, G. R. Drysdale, F. de V. B. Allfrey, H. G. Travers, R. Elsdale, H. Mockler

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Ferryman, J. H. Kennedy, A. J. C. Pollock, E. Walker, A. Ross Thomson, A. L. Y. Dering, P. Grey, E. Hare, J. E. Shearer, C. B. Stewart, E. R. Gould, F. M. Fox, C. G. Graves, A. C. O'Connor, H. D. Smyth Ryland, H. S. Irwin, O. S. Cumming, F. C. Hope, H. C. S. Minchin, G. F. Prettyman, F. S. W. Raikes, J. A. D. Skinner, H. G. Watkin, V. A. Yate, O. I. Wood, W. A. L. Thorne, P. G. Whitelocke LLoyd, H. C. E. Hull, M. G. A. C. Plowden, were elected Associates.

Votes of thanks were passed to R. S. Wahab and J. P. G. Worlledge, the retiring Secretary and Treasurer.

R. E. Parsons was elected Secretary.

E. F. A. Hay was elected Treasurer.

At a Committee Meeting, R. H. Hill, R. C. Money, R. E. Parsons, were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time, until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition :—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus, chosen by the winner, subject to the approval of the President.

The winner may, if he chooses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President,

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President, and obtain his sanction, before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some

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branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1904 was awarded to E. F. A. Hay for an Essay on "The Birds of the Wellington College District."

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the Society, for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). Each collection must be accompanied by a note-book giving dates and localities for all the specimens, and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

III. One or more prizes are offered by the N.S.S. to Members of the Field Club for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being

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considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming these or any other specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1905, the prize in Group I was awarded to H. P. A. Hagreen.

In Group II the first prize was awarded to L. Lawrence Smith, the second to E. P. F. Schweder.

In Group III the first prize was awarded to E. F. A. Hay, the second to J. H. Hay.

Photographic Prizes.

Mr. Blundell offered a prize, value £1, to Members of the Photographic Section, for the best photographs of Natural History subjects. This was awarded to E. F. A. Hay.

Mr. Longland offered a prize for the best photographs of Birds' Nests, Eggs and Young Birds. This was awarded to J. H. Hay.

Mr. Perkins offered a prize, value £1 5s., for the best enlargement, or series of enlargements, made by Members of the Photographic Section during the term. This was divided as follows:

First Prize, R. C. Money. Second Prize, W. E. Pain and E. F. A. Hay, equal.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·61	34·2	25·2	28·1	27·3	84	10	·01	N.E.
2	·61	42·9	16·4	30·1	29·8	94	10	·09	N.
3	·37	46·2	29·5	41·4	40·9	96	10	trace	N.W.
4	·31	47·9	42·2	45·7	45·4	98	10	·06	N.
5	30·29	49·9	44·0	44·1	43·9	98	10	·05	S.W.
6	29·63	53·9	38·2	49·7	49·2	97	10	trace	N.W.
7	30·18	53·1	48.1	51·1	50·2	93	10		N.W.
8	30·27	51·6	42·4	48·7	46·3	82	10		S.W.
9	29·91	50·2	46·4	50·1	49·6	97	10	.07	S.W.
10	30·49	43·3	33·5	36·9	36·1	93	7		N.W.
11	·24	48·4	33·1	40·2	38·3	85	2		S.W.
12	·08	45·9	36·3	37·7	37·7	100	0		W.
13	·39	45·4	25·6	27·3	27·2	98	0		S.W.
14	·32	41·7	26·1	35·7	34·8	92	10		S.
15	30·03	39·1	33·9	37·4	34·0	73	10		E.
16	29·59	42·4	23·7	24·2	24·2	100	10	·36	E.
17	·21	43·4	23·2	37·1	36·8	97	8		S.W.
18	29·84	41·7	29·3	33·2	31·8	84	5		W.
19	30·27	41·9	20·7	24·5	24·5	100	0		S.E.
20	·27	37·7	22·3	35·4	33·0	79	10		N.E.
21	·11	37·1	28·4	29·5	29·4	98	10		E.
22	·24	34·2	28·9	32·9	31·5	83	10		N.E.
23	·27	36·9	31·3	32·7	31·8	89	10		E.
24	·20	45·1	32·1	35·6	35·0	94	10	trace	S.
25	·31	45·1	34·9	42·1	41·9	98	10		N.W.
26	·64	41·2	25·0	29·4	29·0	92	0		N.E.
27	·85	43·4	19·5	33·7	31·1	74	5	·01	N.E.
28	·87	48·9	31·5	43·2	40·7	82	0		S.W.
29	·88	47·6	31·3	33·7	33·3	94	0	trace	S.W.
30	·60	48·1	29·5	40·4	39·3	91	10	trace	S.
31	30·35	47·7	38·2	44·1	40·1	72	0	·01	S.W.
								Total	
Mean	30·27	44·4	31·3	37·3	36·3	91	7·0	·66	
Mean for 28 years	29·97	43·4	32·4	37·8	36·8	90	8·3	1·97	

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FEBRUARY.

Date	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	30·10	51·9	38·4	46·9	46·1	94	10		S.W.
2	29·98	47·2	39·2	44·1	38·4	62	10		S.W.
3	30·32	48·1	34·1	43·1	40·1	77	10		S.W.
4	·38	49·4	42·2	47·1	44·9	84	10	·03	S.E.
5	·45	51·7	46·4	48·9	47·2	88	5		W.
6	·40	48·7	44·4	45·4	43·9	88	10	·07	S.W.
7	·34	49·9	43·7	47·1	46·4	94	10	·02	S.W.
8	·45	45·9	40·4	42·7	42·4	97	10	trace	S.E.
9	·39	47·3	38·4	45·1	44·2	93	10	trace	S.E.
10	·36	49·9	39·2	45·1	43·4	87	10	trace	S.E.
11	·36	43·7	31·5	40·2	37·9	82	5		N.E.
12	·50	42·6	29·3	33·4	32·1	85	10		N.E.
13	·43	49·1	29·5	43·1	41·7	88	5		N.W.
14	·49	53·1	43·2	47·6	45·7	86	10		N.W.
15	·50	48·9	41·4	46·1	43·4	80	10		N.W.
16	·29	52·9	45·3	48·9	47·8	92	10		N.W.
17	·11	50·2	44·7	49·1	44·1	67	4	·02	N.W.
18	30·18	50·4	33·5	47·5	45·7	87	8	trace	N.E.
19	29·90	47·5	35·9	39·4	36·5	77	0		W.
20	29·99	40·9	29·6	34·2	32·0	78	0		N.W.
21	30·35	44·4	33·6	40·1	37·7	81	4	·05	N.E.
22	·34	42·9	31·8	37·3	34·3	75	5	·02	E.
23	30·10	36·9	33·3	35·1	33·8	87	10	·09	N.E.
24	29·91	41·9	33·5	35·4	35·0	96	10	trace	N.E.
25	·96	47·5	33·5	41·7	38·4	76	3	·10	S.W.
26	·33	44·9	35·3	39·4	38·6	94	10	·29	S.W.
27	·19	47·2	31·6	38·7	37·7	91	10	trace	S.W.
28	29·31	46·7	30·5	42·1	37·7	68	10	.05	S.W.
								Total	
Mean	30·16	47·2	36·9	42·7	40·6	84	7·8	·74	
Mean for 28 years	29·99	45·4	32·6	38·4	37·1	88	7·8	1·79	

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MARCH.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·29	43·4	30·5	36·9	36·3	94	10	·01	N.
2	29·90	44·9	35·3	39·7	37·7	84	10	·02	N.E.
3	30·21	44·9	29·3	41·2	37·5	72	5		N.E.
4	30·24	45·9	25·7	38·7	36·6	82	10	·02	N.E.
5	29·82	46·4	38·4	45·6	44·1	88	10	·11	S.W.
6	30·00	49·1	37·8	40·7	38·6	83	10	trace	N.W.
7	29·91	50·6	40·2	47·7	44·9	80	10	·09	N.W.
8	30·09	49·9	34·6	38·7	36·1	78	10	·17	N.W.
9	29·55	51·2	38·4	49·1	46·9	84	10	·06	N.E.
10	·56	52·1	34·3	43·4	39·1	71	8	·05	S.W.
11	·12	49·4	41·2	48·9	48·0	93	10	·15	S.W.
12	·09	49·1	39·4	45·1	42·5	81	5	·22	S.W.
13	·41	53·9	37·8	46·3	44·2	84	5	·45	W.
14	29·24	50·2	44·0	49·1	45·4	75	6	·41	S.W.
15	28·99	47·1	38·0	46·1	44·7	89	10	·56	S.W.
16	29·23	51·9	37·2	45·2	45·1	99	10	·12	S.
17	·56	51·9	39·2	51·5	48·0	77	10	·45	S.
18	29·63	56·7	43·2	49·7	49·2	96	8	·02	N.
19	30·00	56·3	34·5	43·2	42·4	94	0		S.W.
20	29·96	56·2	33·1	46·9	46·2	95	7		S.
21	·78	57·1	41·4	53·9	48·3	66	8		S.
22	·85	62·0	31·5	54·2	50·2	75	4		S.
23	·71	57·6	40·2	54·4	50·3	74	8	·25	S.W
24	·77	53·9	40·0	49·2	48·0	92	10		N.
25	·85	50.4	38·2	45·1	43·1	85	10	·09	S.W.
26	·89	57·5	36·7	44·2	41·9	83	0	·05	S.
27	·67	50·3	41·0	42·3	41·7	95	10	·03	S.E.
28	·93	55·4	37·2	50·2	46·1	73	5		S.W.
29	·87	56·4	45·0	51·7	48·0	76	10	·02	S.W.
30	29·86	55·5	44·4	50·7	46·2	71	10		S.W.
31	30·07	55·2	35·3	50·9	44·5	60	4	·01	S.W.
								Total	
Mean	29·71	52·0	37·5	46·5	43·9	82	7·8	3·36	
Mean for 23 years	29·88	49·5	33·5	41·8	39·8	83	7·3	1·84	

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APRIL.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind
	In.	°	°	°	°	%	0—10	In.	
1	30·27	59·6	35·5	47·1	46·1	92	10		S.W.
2	29·91	55·6	43·5	48·2	45·6	81	10		W.
3	30·09	50·7	30·8	43·1	41·7	88	10	·07	E.
4	29·95	54·1	39·0	50·2	48·5	88	10	·05	S.
5	29·81	56·4	46·6	52·1	46·1	63	8		N.E.
6	30·05	46.1	35·5	40·9	39·9	92	10	·07	N.W.
7	29·71	53·1	27·6	44·5	44·1	97	10	·15	N.W.
8	30·00	46·5	28·2	40·2	37·1	76	8	trace	N.
9	29·72	49·9	29·3	44·1	43·7	97	10	·37	W.
10	·40	50·1	39·4	45·2	45·2	100	10	·22	S.E.
11	·34	53·2	42·0	48·5	48·0	96	10	·04	S.E.
12	·79	62·0	43·2	51·4	49·2	85	8		S.E.
13	·81	61·1	42·2	60·4	54·0	64	5	·07	S.E.
14	·71	60.1	48·3	52·9	52·0	94	10	·05	S.W.
15	·71	59·4	41·7	56·3	49·2	60	4		S.W.
16	·64	61·1	40·4	54·4	49·0	64	2	·02	E.
17	·89	50·9	41·4	46·5	42·1	70	10	trace	N.E.
18	·92	46·9	35·7	44·5	38·7	61	10	·02	N.
19	.88	46·7	32·5	44·1	40·1	72	10	trace	N.E.
20	·91	48·3	35·3	42·7	39·4	76	10	·02	N.E.
21	29·90	49·6	37·7	41·6	39·7	85	10	trace	N.
22	30·14	49·2	36·3	40·7	36·0	65	10		N.
23	30·00	49·7	35·1	47·1	41·9	66	8		N.W.
24	29·92	50·6	33·5	45·7	42·6	77	10		N.W.
25	30·02	51·5	32·3	48·6	43·9	69	10	·09	W.
26	29·99	57·4	45·4	51·2	49·0	85	10	·04	W.
27	·86	56·2	46·6	52·4	50·2	85	10		S.W.
28	·69	54·9	48.1	53·4	49·5	75	10		S.W.
29	·54	58·8	46·3	52·7	48·2	72	5	·13	S.W.
30	29·42	56·9	41·2	48·2	47·5	94	10	·16	S.W.
								Total	
Mean	29·83	53·6	38·7	48·0	44·9	80	8·9	1·57	
Mean for 28 years	29·88	55·7	36·9	48·0	44·5	78	7·1	1·45	

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MAY.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·46	58·1	45·5	55·2	48·6	62	10	·10	N.W.
2	·39	56·9	41·4	48·3	45·9	82	10	·06	S.W.
3	29·97	56·1	39·5	49·9	44·1	63	6		S.W.
4	30·23	57·4	31·3	50·2	45·9	72	10		N.E.
5	·37	59·8	41·4	50·2	45·7	71	5		N.E.
6	·26	64·8	34·8	54·4	47·2	58	0		N.E.
7	·13	68·4	37·8	61·7	54·2	61	2		N.E.
8	·13	59·0	45·4	55·5	49·0	62	10		N.E.
9	·42	63·1	30·3	56·2	48·8	58	0		N.W.
10	·36	68·1	37·2	62·2	53·0	54	2		N.
11	·23	64·8	37·4	60·9	54·6	65	5		N.
12	·28	59·5	41·2	56·1	48·2	56	2		N.E.
13	·36	59·8	35·3	54·2	49·2	69	8		N.
14	·33	56·1	44·5	47·1	46·1	92	10		N.
15	·32	61·8	41·5	55·9	52·2	77	5		N.W.
16	·27	65·8	35·5	57·5	54·8	84	2	·12	N.W.
17	·19	70·7	45·2	65·4	47·2	59	8		N.W.
18	·16	69·8	41·5	62·9	52·2	48	8	trace	N.
19	30·08	65·5	45·2	54·9	51·0	76	10	·01	N.
20	29·96	62·0	43·4	50·1	47·8	84	10		N.E.
21	30·02	52·4	42·4	46·7	41·9	67	10		N.E.
22	·00	53·9	29·7	46·9	41·1	62	5		N.E.
23	30·02	67·1	27·4	49·5	46·1	77	6		N.E.
24	29·90	62·3	34·3	56·6	48·6	56	8		N.E.
25	30·01	64·1	47·6	61·7	52·3	53	5		S.W.
26	·08	66·9	41·2	60·9	51·0	51	6		S.W.
27	·19	70·2	41·4	65·1	55·2	52	5		S.W.
28	·28	75·4	47·1	65·1	56·5	58	2		S.W.
29	·12	79·2	48·3	71·7	62·1	55	0		S.W.
30	·14	71·7	53·0	66·7	60·4	67	10	·30	S.W.
31	30·08	67·1	52·0	61·7	57·4	76	10	·05	N.W.
								Total	
Mean	30·12	63·8	40·6	56·8	50·3	65	6·1	·64	
Mean for 28 years	29·97	61·8	42·3	54·2	49·9	74	6·8	1·75	

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JUNE.

Date	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	°/o	0—10	In.	
1	30·05	68·4	49·3	58·7	57·4	91	8	·07	N.W.
2	·09	67·9	50·0	62·9	57·2	68	10		S.E.
3	·11	70·7	52·0	65·9	56·8	56	4		S.E.
4	30·05	67·9	54·0	60·9	55·3	68	10	·05	N.
5	29·95	52·9	51·0	51·7	51·0	95	10	1·00	N.E.
6	·83	51·1	47·3	50·1	50·0	99	10	·58	N.E.
7	·83	57·8	44·5	49·7	49·0	95	10	·26	N.
8	·95	63·8	49·1	57·1	53·0	75	10	·02	N.
9	·92	56·9	47·3	52·7	50·5	85	10	trace	N.E.
10	·94	65·1	47·1	52·9	50·8	86	10	·11	N.E.
11	·86	59·3	48·9	51·4	50·8	96	10	·19	N.E.
12	·82	65·0	50·3	59·1	56·7	85	10	·21	N.E.
13	·87	71·1	51·8	64·7	58·5	67	8	trace	N.E.
14	·83	69·4	48·4	62·1	58·2	77	10		N.E.
15	·76	72·4	43·4	64·7	58·4	67	3		S.E.
16	·81	73·9	52·0	69·9	63·4	66	10	·49	S.E.
17	·77	67·1	56·8	60·2	59·7	96	10	·23	S.E.
18	·77	64·3	52·2	58·3	54·2	76	8	trace	N.
19	29·89	67·9	51·0	62·7	57·1	69	8		S.W.
20	30·11	68·9	53·2	62·1	57·2	73	10	trace	S.W.
21	·24	71·4	56·2	67·9	61·7	68	10		S.
22	·40	76·9	47·3	70·7	61·1	55	0		N.E.
23	·40	73·2	51·8	69·1	59·7	56	0		N.E.
24	·30	70·5	46·3	58·1	55·8	86	10		N.E.
25	·16	74·7	52·2	65·3	59·5	68	8	trace	N.E.
26	30·00	73·1	55·6	63·4	58·7	74	5		N.W.
27	29·93	77·9	54·0	72·4	64·4	61	2		N.E.
28	·84	73·1	52·0	68·4	61·1	64	6		N.W.
29	·73	66·1	50·1	65·3	60·4	73	10	·54	N.W.
30	29·77	67·1	57·9	61·4	61·1	98	10	·27	N.W.
								Total	
Mean	29·97	67·5	50·8	61·3	57·0	76	8·0	4·02	
Mean for 28 years	30·05	68·1	47·6	60·2	55·5	75	7·1	2·04	

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JULY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·84	72·3	58·1	63·7	63·1	96	10	·01	N.W.
2	30.05	71·7	52·6	65·9	60·4	70	2		S.W.
3	·25	74·4	56·5	61·7	59·1	84	10		S.W.
4	·23	69·1	51·2	68·1	60·1	60	10		S.W.
5	·03	72·9	54·3	68·1	59·9	59	8	·02	S.W.
6	·09	67·2	55·2	62·2	55·6	64	10		N.
7	·18	77·9	42·5	66·1	57·6	59	0		N.
8	·17	82·1	49·3	77·2	67·3	56	0		N.W.
9	·06	81·2	56·5	70·9	66·2	75	5		N.E.
10	·10	69·9	55·0	69·3	64·4	74	10		W.
11	·12	76·2	60·4	69·2	65·4	79	6		W.
12	·12	76·4	60·1	70·2	64·1	69	8		N.W.
13	·24	78·9	55·2	70·7	62·1	59	10		N.W.
14	.25	80·1	55·3	73·9	65·1	59	6		N.W.
15	30·11	75·1	60·4	70·1	62·1	61	8		N.W.
16	29·98	71·1	56·0	58·7	56·6	87	10	·05	W.
17	30·07	70·3	46·1	65·7	58·9	64	5	trace	N.W.
18	·01	71·5	54·5	64·6	61·7	83	10		W.
19	·30	74·1	45·1	67·1	57·7	55	8		W.
20	·22	78·9	48·3	73.4	63·9	56	6		N.W.
21	·14	81·7	53·2	70·7	69·3	92	8		N.W.
22	30·07	79·3	55·5	73·1	66·1	66	5	·32	N.W.
23	29·89	70·4	61.1	62·2	60·9	92	10	·11	W.
24	30·04	73·4	54·6	62·7	58·9	78	10		W.
25	·08	78·9	53·0	74·2	66·9	65	10		W.
26	·07	82·1	57·1	73·4	67·3	70	8		N.W.
27	·00	76·2	58·4	69·9	67·7	87	10		N.W.
28	·04	70·9	54·0	64·9	60·9	77	10		N.W.
29	30·00	71·3	56·5	70·1	63·4	66	8		W.
30	29·92	74·1	58·3	62·2	56·0	66	6		W.
31	30·09	71·2	51·2	66·1	60·2	69	8		W.
								Total	
Mean	30·09	74·9	54·4	67·9	62·2	71	7·6	·51	
Mean for 28 years	29·99	71·0	51·5	63·3	58·8	76	7·0	2·13	

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AUGUST.

Date.	Barom. Reduced	Thermometers. Max.	Min	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·97	69·9	47·9	65·7	56·8	57	8		W.
2	·92	72·1	44·2	66·7	57·1	53	8	·30	W.
3	·58	67·9	53·2	57·9	57·4	96	10	·25	W.
4	·53	71·4	57·4	67·1	60·9	67	8	·07	N.W.
5	29·68	67·9	56·6	64·9	59·7	71	5	·30	W.
6	30·09	68·7	45·2	62·2	57·1	72	5	·03	S.W.
7	29·93	66·1	52·6	57·9	55·7	86	10		S.
8	·99	72·1	57·3	64·7	61·5	81	8		W.
9	·99	65·3	51·5	60·4	57·9	85	10	·02	W.
10	29·96	68·2	52·0	64·1	57·0	63	5	·07	S.W.
11	30·05	66·0	47·3	62·2	55·2	63	5		S.W.
12	·31	66·8	46·6	65·4	57·9	61	8		S.W.
13	·31	69·3	46·8	60·9	56·4	74	10		S.W.
14	·21	75·2	46·0	65·8	59·3	65	7		S.E.
15	·09	74·2	47·1	67·1	61·4	70	10		S.E.
16	·05	69·4	56·6	64·2	59·4	73	10		S.E.
17	30·16	72·9	42·4	64·9	59·1	68	10	trace	S.E.
18	29·90	71·7	53·2	62·2	60·5	90	10	·07	S.W.
19	·97	68·9	51·1	64·2	56·5	60	8	·20	S.W.
20	29·80	69·9	53·0	59·0	58·3	95	10	trace	S.W.
21	30·08	67·9	47·4	65·5	59·1	66	5	·12	W.
22	29·89	68·1	55·2	59·7	58·2	89	8	·17	W.
23	·84	65·4	47·9	60·9	54·2	63	8		S.W.
24	·97	67·2	39·4	63·1	60·1	82	8		S.W.
25	·99	69·4	46·3	65·9	59·7	67	10	·17	S.W.
26	·85	64·6	55·5	61·7	58·7	82	10	·02	S.W.
27	·70	63·3	50·5	55·9	53·9	87	9	·25	S.W.
28	·41	66·8	49·5	58·6	58·1	97	10	·57	W.
29	·34	64·2	52·2	54·2	54·2	100	10	trace	W.
30	29·71	59·3	50·5	55·1	52·0	81	8		N.W.
31	30·25	61·0	51·2	56·9	56·9	100	9		N.W.
								Total	
Mean	29·92	68·1	50·1	62·1	57·7	76	8·4	2·61	
Mean for 28 years	29·96	70·0	50·7	62·1	58·1	77	6·9	2·20	

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SEPTEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humility.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·27	62·1	44·5	57·6	56·0	89	5	·06	S.W.
2	29·93	67·7	54·5	61·9	58·1	78	10		W.
3	29·93	72·5	56·2	61·3	60·1	93	10		W.
4	30·13	70·4	56·0	63·6	60·7	83	10	·01	N.W.
5	29·99	67·3	55·2	58·9	58·2	95	10	·07	S.W.
6	·74	67·5	58·5	65·1	64·7	98	10	·29	S.
7	·62	61·3	55·0	61·1	57·4	78	10	·20	S.W.
8	·81	65·3	52·2	59·7	55·2	74	3	.06	S.W.
9	·89	61·0	55·0	58·4	56·8	89	10	·41	S.W.
10	·61	63·8	52·5	58·5	57·7	94	10		W.
11	29·94	60·8	51·5	55·4	53·2	86	10		N.W.
12	30·23	64·6	39·4	57·2	52·2	70	0		W.
13	·29	64·5	41·5	56·4	54·4	87	2	·12	S.
14	·24	61·0	39·2	51·2	50·4	94	0		N.
15	·29	60·3	34·8	49·9	46·2	75	2		N.E.
16	·23	60·8	40·4	54·6	51·8	81	5		N.
17	·34	63·4	40·8	56·4	53·7	83	0		N.
18	30·15	61.6	44·4	55·9	52·8	81	0		N.E.
19	29·94	63·8	44·9	59·9	55·3	73	10		N.E.
20	30·13	59·6	41·2	58·4	55·6	83	10		N.E.
21	.23	60·8	33·3	53·5	50·2	78	10	.08	N.E.
22	30·05	56·9	41·2	52·7	52·7	100	10	trace	N.
23	29.84	56·3	49·0	52·9	51·2	88	10		N.
24	·69	57·1	43·4	54·2	50·2	75	5	·03	E.
25	·69	52·9	47·1	50·4	50·2	99	10	·45	N.E.
26	·81	54·4	47·3	50·1	50·0	99	10	.22	N.E.
27	29·69	57·8	48·1	51·4	51·2	99	10	·02	N.E.
28	30·21	60·0	47·3	57·4	55·0	85	8	·16	N.
29	29·81	61·8	50·0	53·9	53·6	98	10	trace	N.E.
30	29·95	61·6	46·1	55·0	47·6	57	10		N.W.
								Total	
Mean	29·99	62·0	47·0	56·4	54·1	85	7·3	2·18	
Mean for 23 years	30·02	65·3	47·5	58·1	55·1	82	7·0	1·87	

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OCTOBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·94	56·4	36·1	48·7	45·6	78	10		N.W.
2	·84	53·9	44·4	50·3	46·5	74	8		N.W.
3	·95	56·7	43·2	50·2	44·9	66	3	·01	N.E.
4	·48	56·1	51·8	55·2	53·8	90	10	.09	S.W.
5	29·60	55·9	50·0	54·4	49·5	70	8		S.W.
6	30·12	51·9	36·1	47·4	41·1	60	3		S.W.
7	·28		32·5	51·4	47·4	74	10		N.W.
8	·30	53·4	45·4	50·5	49·8	95	10		N.
9	·39	57·8	41·6	53·4	51·5	87	10		N.W.
10	·49	54·9	47·1	54·2	51·2	80	10		N.E.
11	·45	52·9	44·7	51·7	49·0	81	8	·01	N.E.
12	·32	54·9	46·1	49·1	48·5	96	10		N.E.
13	·01	53·7	48·3	52·4	50·3	85	10		N.
14	30·14	52·5	28·6	43·7	38·1	62	5		N.
15	29·64	57·2	43·0	52·3	49·3	80	10	·23	W.
16	29·88	47·7	35·3	41·2	38·4	78	0		N.
17	30·06	49·1	22·5	44·4	39·4	65	6		N.
18	·05	54·1	26·8	47·1	41·7	64	0		N.W.
19	·11	49·1	30·3	46·2	42·1	72	4		N.E.
20	·23	48·9	27·4	44·7	41·4	76	2		N.E.
21	.02	45·5	26·4	41·2	38·1	76	10	·06	N.E.
22	·01	47·5	23·7	34·2	31·6	74	0		N.
23	·14	48·9	27·4	39·5	38·4	91	0		N.
24	·12	47·1	29·5	44·4	42·1	83	8		N.
25	·22	47·2	29·6	35·5	35·0	95	10		N.E.
26	·27	50·9	24·0	44·9	42·1	79	10		N.E.
27	·19	54·1	43·2	50·7	47·5	78	10	trace	N.E.
28	30·14	55·3	30·1	44·4	43·7	95	10	·26	S.
29	29·63	57·4	43·4	48·6	48·5	99	8	·55	S.W.
30	·30	52·7	39·2	48·4	47·8	95	10		S.W.
31	29·29	54·9	42·7	50·1	46·4	75	10	·30	S.W.
								Total	
Mean	30·02	52·6	36·8	47·4	44·5	80	7·2	1·51	
Mean for 28 years	29·91	56·2	41·0	49·5	47·6	87	7·4	2·99	

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NOVEMBER.

Date.	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	29·18	59·1	37·2	48·2	48·2	100	10	·70	S.W.
2	·26	53·3	45·2	48·5	47·0	89	8	·15	S.W.
3	·56	54·5	38·4	50·1	49·2	94	10	trace	S.W.
4	·74	52·9	30·3	48·1	47·3	94	10	·33	S.E.
5	·29	46·6	42·9	45·9	45·7	99	10	·06	S.W.
6	·41	52·9	34·1	44·2	43·4	94	0	·08	S.W.
7	·65	53·1	27·4	42·1	41·4	95	10	trace	S.W.
8	29·92	49·9	28·6	40·2	39·9	97	5		S.W.
9	30·06	48·2	35·3	42·4	42·1	98	10		S.
10	30·01	52·7	32·1	42·1	41·9	98	10	·65	S.E.
11	29·37	52·5	41·2	51·9	51·8	99	10		S.
12	29·41	53·9	41·0	46·1	44·6	89	2	·30	S.W.
13	28·91	44·9	38·7	43·1	43·1	100	10	·09	N.W.
14	29·40	43·5	40·2	41·7	41·1	95	10	·02	N.W.
15	·61	42·9	35·3	42·1	39·2	78	3	trace	N.W.
16	29·81	40·1	29·3	35·1	34·3	92	10		N.W.
17	30·05	40·2	24·7	31·9	31·3	91	10	trace	N.W.
18	30·15	36·4	28·4	34·1	34·0	99	10		N.W.
19	29·70	38·1	32·1	35·7	33·5	80	10		N.E.
20	29·86	42·9	27·6	32·7	31·4	83	2		N.E.
21	30·12	41·9	20·0	35·7	32·4	72	8		N.E.
22	30·11	51·1	23·6	39·3	36·8	80	6	·22	S.E.
23	29.62	50·9	38·4	50·1	50·0	99	10	trace	S.W.
24	·80	49·1	34·1	44·4	42·5	85	0	trace	S.W.
25	·79	52·7	30·5	38·4	37·9	95	10	·05	S.W.
26	·22	53·9	37·5	52·6	52·6	100	10	.36	S.W.
27	·63	45·1	37·2	40·7	40·1	95	0	·01	W.
28	·43	45·5	37·5	43·3	43·3	100	10	·02	W.
29	29·82	46·9	41·4	42·1	41·2	93	10	trace	N.W.
30	30·09	45·1	27·5	43·4	41·9	87	10	·26	S.W.
								Total	
Mean	29·67	48·0	33·9	42·5	41·6	92	7·8	3·30	
Mean for 28 years	29·95	49·5	37·1	43·6	42·5	92	8·1	2·55	

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DECEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·22	43·9	39·2	41·1	41·1	100	10	trace	S.
2	·39	47·1	35·8	43·7	43·7	100	10	trace	S.
3	·37	36·5	28·4	30·2	29·6	60	10	·01	N.W.
4	30·27	41·9	29·1	34·9	34·8	99	10	trace	S.W.
5	29·97	48·9	34·3	40·2	39·9	96	10	·15	S.W.
6	·82	54·7	38·4	44·5	42·9	87	10	·05	S.
7	29·92	58·9	43·2	54·2	52·8	90	10	·26	S.
8	30·05	50·1	48·1	48·7	48·7	100	10	·01	S.
9	·22	46·1	36·5	42·7	42·2	96	5		S.W.
10	·58	45·5	25·7	30·1	28·8	80	0		N.W.
11	·82	37·4	23·0	29·7	29·0	88	10		N.E.
12	·79	40·9	24·1	32·1	30·8	83	10	trace	N.
13	·73	41·9	30·6	34·4	34·3	99	10	trace	N.
14	·55	42·9	30·3	41·7	41·7	100	10		N.E.
15	·41	41·1	37·2	39·7	38·9	94	10		N.E.
16	·31	39·5	35·8	37·7	36·6	90	10		N.E.
17	·31	40·9	33·5	38·4	37·4	91	10	·06	S.E.
18	30·22	45·4	37·2	40·5	39·9	95	10	·01	S.E.
19	29·99	51·2	37·2	45·2	42·9	83	8	·02	S.E.
20	30·25	48·1	32·3	44·9	43·9	92	10	trace	S.W.
21	·36	48·9	43·2	47·9	46·1	87	10		S.W.
22	·42	45·7	43·0	45·1	43·4	87	10		S.W.
23	·29	41·6	39·2	41·2	39·7	88	10		S.
24	·29	41·3	39·0	39·9	38·6	89	10		S.W.
25	·24	47·5	35·8	41·2	40·5	94	10		S.W.
26	30·12	43·7	28·9	40·1	40·1	100	10		S.E.
27	29·72	40·6	31·8	33·9	33·6	96	10	·16	E.
28	·47	45·7	32·7	40·4	40·4	100	10	·09	S.E.
29	·25	42·9	39·5	42·1	42·1	100	10	·06	N.W.
30	29·97	38·9	36·8	42·7	37·1	61	10		N.E.
31	30·21	34·2	23·5	30·1	28·3	72	10		E.
								Total.	
Mean	30·21	44·3	34·6	40·0	39·0	90	9·5	·88	
Mean for 23 years	29·92	44·2	33·1	38·7	37·7	91	8·2	2·30	

Total rainfall for the year, 21·98 in.
Mean for 23 years, 24·93 in.

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FIELD CLUB SECTION.

The number of members in this section has been well maintained; the various sections being made up as follows:

Botany	1
Entomology	14
Geology	1
Ornithology	42
Photography...	14
	72

It will be seen that the Entomologists were a much smaller number than usual, but this branch grew as the birds' nesting season advanced. The note books, with the exception of a very few, were not up to such a high standard as they were during the past year or two; it might be pointed out here that these note books are supposed to be a record of work done, so far as is possible, throughout the year, and not merely confined to the summer term in order to qualify for the excursions. At the same time, it is a sign that the Field Club is doing good, inasmuch as there are many more members who are restricting their work to some definite subject, and it is to be hoped that this will be still more the case in future. The same list of subjects that was suggested last year has been retained, it is as follows:

NATURAL HISTORY.

1. Devices in plants to prevent the visits of undesirable insects.
2. The migratory birds of the district.
3. Local ants, bees and wasps.
4. Local snails and slugs.
5. Spiders.
6. Caterpillars and their colouring, in relation to food plants (from a protective point of view).

PHOTOGRAPHIC.

1. The forms of Trees, both in and out of leaf.
2. The barks of Trees.
3. Grasses, in flower if possible.
4. Clouds and Cloud effects.
5. Domestic animals.
6. Fungus life.

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EXCURSIONS.

Four excursions took place in the course of the summer term, all of which were successful in point of view of weather and enjoyment.

Saturday, May 20th.

A large party made their way over to Strathfieldsaye, by kind permission of the Duke of Wellington, leaving the College at 1 o'clock, having lunched previously. The party, some on bicycles, the rest in brakes, were met at the Monument by Mr. North, and after having found out where they might go, dispersed in various directions, the keepers being very kind in conducting different small parties about. After a thoroughly good ramble through the Park, chiefly in search of birds, Mr. and Mrs. North most hospitably entertained us all at tea.

Saturday, June 17th.

A party of 24 left by the 11.57 train, and went to Goring; after lunching in the Church House, we went our various ways with different objects in view and reassembled at Long Meadow about 5 p.m., where Captain and Mrs. Towse entertained us with their usual kindness at tea. It was a lovely sunny day, but with a rather blustering East wind which proved somewhat fatal to the Entomologists, who are more dependent on the weather than the rest, and Streatley Hill, a great place for various butterflies, did not come up to our expectations in its yield. The Botanists who generally fare well in this locality, came off better and were the most satisfied at the end of the day.

Saturday, July 8th.

An excursion to the Hog's Back took place, 21 members taking part. Detraining at Wanborough, we lunched in the beech wood at the top of the hill, meeting again for tea at the Jolly Farmer Inn, at Puttenham. Mrs. Sturgis kindly gave us permission to explore her big disused chalk-pit. Nothing worth special mention was taken, but a thoroughly enjoyable day was spent.

Saturday, July 15th.

A party of over 30 went by brake and bicycle to Hook Common, where the White Admirals and Silver-washed Fritillaries were plentiful, but as usual they proved very hard to catch. We lunched by the roadside and then dispersed, to meet again at a very pleasant tea, on the lawn at Lady Dorchester's house, and our thanks are once more due to our kind hostess for her hospitality.

H. PUREFOY FITZGERALD.

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PHOTOGRAPHIC SECTION.

1905.

BALANCE SHEET.

RECEIPTS.

	£	s.	d
Balance from 1904	7	11	9
Lent Term—Entrance fees		7	0
Subscriptions	1	6	0
Easter Term—Entrance fees	1	10	0
Subscriptions	2	12	0
Michaelmas Term—Entrance fees ...		9	0
Subscriptions	1	17	0
	£15	12	9

EXPENDITURE.

		s.	d.
Lent Term—Knight, Hypo		3	6
Attride, Enamelling Dishes...		2	6
Sweeping		7	6
Glass for Key		5	0
Easter Term—Knight, Hypo		8	9
Sweeping		7	6
Glass for Key		5	0
Michaelmas Term—Two mantles ...		1	0
Knight, Hypo		13	6
Sweeping		7	6
Glass for Key		5	0
Balance in hand	12	6	0
	£15	12	9

G. E. BLUNDELL.

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NIGHT JAR & YOUNG J. H. Hay

TREE-PIPIT ON NEST E. F. A. Hay

ROCK-PIPIT E. F. A. Hay

ECLIPSE of SUN, 1905, Aug 30 R. C. Money

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PHOTOGRAPHIC SECTION REPORT.

This section during the past year has been even more active than in 1904, and one is glad to be able to record the fact that its range of subjects is constantly widening. Natural history subjects have quite rightly, as this is a branch of the N.S.S., been much to the fore. Hay ma., Hay mi. and Pain have each produced a series of pictures of wild adult birds which have a real value as natural history studies. In fact it is a matter of regret that with such excellent photographs produced yearly by some members of the section no copies either in the form of prints in an album or of lantern slides are preserved by the Society.

Three of the photographs taken by bird photographers are here reproduced. It must be admitted that Hay mi. has been most successful in securing the nightjar with its young, while the markings of the rock pipit are well shown in his brother's picture.

The photograph of the partial eclipse of the sun was taken by R. C. Money at Llandrindod Wells, South Wales, on August 30th, 1905, at 0 hrs. 22 min. It is remarkable for the large amount of the body of the moon which appears to be visible beyond the limb of the sun.

The enlarging lantern has been in constant use, and not only in the winter as was expected. The results improve in quality, tend to increase in size, and now that toning has become the fashion, vary from black to the seediest of yellows.

G. E. BLUNDELL.

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THIRTY-SEVENTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1906.

HEROUM FILII

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."
'Επιστολὴ πρὸς 'Ρωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1907.

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AS
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37

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'Επιστολὴ πρὸς 'Ρωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1907.

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THE WELLLINGTON COLLEGE PRESS :
PRINTED BY THOMAS HUNT.

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BLACK-BACK GULLS AT GIBRALTAR. R. C. Money.

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Contents.

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RULES.

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1. That this Society be called the "WELLINGTON COLLEGE NATURAL SCIENCE SOCIETY."

1. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That all Members of the School be eligible as Associates and that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee, and elected by the Members; their names with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other benefactors.

18. That Members and Associates pay a subscription of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That members may speak and vote at all meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26, That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, and a Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

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SECRETARY { R. E. PARSONS, L. LAWRENCE SMITH

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DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, Esq.

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J. F. GLASS
C. E. WALES
R. C. FISH
S. W. THOMPSON
N. S. COLLIER JOHNSTON
R. ST. J. BLACKER DOUGLASS
T. M. LOVETT
R. C. MATTHEWS
J. C. JOUBERT DE LA FERTE
G. R. H. WALLACE
J. W. S. GALBRAITH
G. S. WALKER
R. G. WILSON
G. F. WELCH
D. A. WILLIAMSON
H. J. ELLER
E. W. T. AGAR
K. F. M. POWER
D. M. SEALY
A. B. TURNER

* Left Easter Term, 1906. † Left July, 1906. ‡ Left Christmas Term, 1906.

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List of the Societies and Journals to whom Copies of the Report are sent.

—:o:—

*Cheltenham College N.H.S.
Christ's Hospital N.H.S.
Clifton College N.H.S.
*Dulwich College N.H.S.
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*Felsted School N.H.S.
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*Harrow School Scientific Society.
King Edward's School, Birmingham, N.H.S.
*Malvern College N.H.S.
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British Museum (Natural History).
Geological Survey Office.
Linnean Society.
Royal Meteorological Society.
*U.S. Geological Survey Office.
*Chicago Academy of Sciences.
*El Instituo Geologico de Mexico.
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*University of Montana.
*Wisconin Academy of Sciences, Arts and Letters.
Nature.

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BLACK-HEADED GULLS. J. H. Hay.

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ACCOUNTS.

RECEIPTS.

	£	s.	d
Balance in hand	106	16	2
Subscriptions:—			
Lent Term—Honorary Members ...	3	12	0
Members and Associates	6	13	0
Easter Term—Honorary Members		10	6
Members and Associates	7	4	0
Michaelmas Term—Honorary Members	1	8	6
Members and Associates	5	15	0
Bursar for use of Lantern, Gas, &c. ...	2	10	0
Sale of Report	8	16	8
Interest on Deposit	2	8	0
	£145	13	10

EXPENDITURE.

	£	s.	d.
Gas, Limes, &c. for Lectures... ...	2	9	4
Hire and Purchase of Slides ...		17	8
Stamps...	1	6	7
Carriage of Parcels		11	9
Hook, for reading Thermometers ...	2	0	0
Cutting grass round Meteorological Instruments		1	0
Prizes	3	0	0
Hunt for printing Report	14	15	6
Plate for Report	1	10	3
Hunt for printing Notices		10	6
Account Books		6	2
Meteorological Charts		5	0
Repairs to Rain Gauge		1	9
Enlarging Photographs for Museum	4	16	8
Balance in hand	113	1	8
	£145	13	10

Examined and found correct,

December 17th, 1906. S. A. SAUNDER.

R. A. PETERS, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 10th.

S. A. Saunder, Esq. exhibited some Astronomical Photographs with short explanations.

The first photographs shewn were arranged to illustrate the progress of Lunar photography from its earliest stages to the present day. The details of the Daguerrotype process were announced in August 1839, and in March 1840 Dr. J. W. Draper succeeded in obtaining a series of Daguerrotypes of the moon, the exposure required being 20 minutes. The first photograph shewn was one taken in 1852 by Mr. J. A. Whipple with the 15 inch refractor of the Harvard Observatory. The next was taken with the 8 inch refractor of the Liverpool Observatory in 1854 by Dr. Edwards and Mr. Forrest with an exposure of about two minutes. These were followed by others taken by Mr. Whipple in 1860, shewing a considerable improvement on his earlier efforts, by Dr. de la Rue in 1861, and by Dr. Henry Draper in 1862. Dr. Draper used a reflecting telescope with a mirror ground and polished by himself. In the intervals of his professional practice he ground and polished over 100 mirrors before he obtained a satisfactory one of 15½ inches, subsequently replaced by one of 28 inches, with which his later work was accomplished. Lewis Rutherford commenced to photograph the moon in 1858, and after trying various devices he conceived the idea of making an object glass specially corrected for the photographic rays. This was completed by December 1864 and in the following March he secured photographs of the moon far superior to anything previously accomplished. Other photographs shewn were taken by Dr. Gould in 1873, by Mr. Ellery with the Melbourne reflector in 1875 and by Alvan Clarke in 1878. The modern era of lunar photography commenced with the foundation of the Lick Observatory, on the top of Mount Hamilton in California, at an altitude of over 4000 feet. The Observatory is furnished with a great refracting telescope of 36 inches diameter, and was handed over to the Regents of the University of California on June 1st, 1888. By this time dry plates of great rapidity were obtainable, and in July and August of the same year Professor Burnham secured a series

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of negatives of the moon running through an entire lunation. The next great observatory to take up the work was that of Paris, where the great Equatorial Coudé has for the last twelve years been almost entirely devoted to photographing the moon. Excellent as these photographs are, they have recently been surpassed by those taken at the Yerkes Observatory, about 70 miles from Chicago, by Mr. Ritchey. But it is not only in lunar photography that Mr. Ritchey has shewn his pre-eminence. Series of photographs of the great nebulæ in Orion and Andromeda were shewn, and in each it appeared that the amount of detail which could be seen in Mr. Ritchey's photographs was far beyond that shewn in any of the others. These were followed by some of Professor Barnards' photographs of comets, of star clusters, and of the Milky Way, these last giving some faint idea of the inconceivable number of stars of which our Universe is composed.

Saturday, March 3rd.

W. P. Watmough, Esq., gave a demonstration of the Tabloid brand of Photographic Chemicals.

A vote of thanks to the lecturer was proposed by Mr. Fitz-Gerald.

Saturday, March 10th.

G. E. Blundell, Esq., gave a lecture on "Tracks and Trails and how to read them."

The lecturer began by pointing out the considerable difference that exists in the feet of various animals, and showed that if these were impressed upon a suitable surface the result was a series of signatures from which we might infer not only the presence of the animal, but might even obtain information as to its age, habits, the pace it was going and the time since it passed.

The distinctness of such a trail depends on the material, and a series of slides was exhibited shewing the tracks of a hare on snow, and its subsequent capture by a dog. Those on sand were illustrated by the track of a lame fox near the gas works, and those on mud and grass by the tracks of badger and deer. It was pointed out that even over rocky ground the movement of a pebble or the mark of a hoof on a rock might show an animal's course. A series of photographs of the tracks of game and water birds and of the common British mammals was then shown, and their distinctive characters pointed out. Methods by which the pace at which

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an animal was travelling might be judged were also indicated, such as the change in pattern of the trail illustrated by that of a horse walking, trotting, galloping and cantering.

The determination of the time when a track was made is one of the most interesting and difficult branches of the subject. Some of the possible methods were shown by photgraphs, e.g. the mud drying on a twig in a deer's tracks, frost on a fox's, a badger's before and after rain, worm casts thrown on tracks during the night, and others.

The lecturer then gave some instances from his inexperienced days to show how easily one might be led to wrong conclusions, and suggested that beginners should start with easy examples, a few of which were thrown on the screen. He then described the best kind of places to look for tracks, and by a number of photographs taken in the same wood showed how we might follow an animal such as a badger, and get an insight into its family life and amusements.

He then showed a series of tracks we should see if we walked along a mountain stream, and pointed out that though we might not see a living creature yet the records of everything that had passed the night before, such as the otters, the foxes and the poachers, were there if we chose to read them.

A vote of thanks to the lecturer was proposed by Mr. Moore.

Saturday, March 24th.

J. L. Bevir, Esq., gave a lecture on "The Sahara."

Although the Sahara covers an area of some two and a half millions of square miles, it contains practically only three main varieties of scenery, all of them with the same character of barrenness. First there is the district round the base of the Atlas, a low plateau strewn with blocks of granite and other rocks, another part is covered with rounded pebbles, and thirdly, there is the region of the sand dunes. Ancient legend describes the Sahara as an inland sea, and hither it was that the Argo was supposed to have sailed. In support of this the frequent deposits of salt were quoted, the general nature of the country which was supposed to consist of a more or less uniform expanse of sand, and the extended tracts of small, polished and rounded pebbles. But since the French became masters of Algeria our knowledge has been completely revolutionised, the country is found to be highly diversified and the pebbles are supposed to have been rounded by driven sand. Considering the country as the hinterland of Tunis, Algeria and Morocco, the lecturer compared the inhabitants to the sand of their native desert, which is incapable of cohesion,

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but when driven by the wind, is destructive of all cultivation. Just so the sons of the desert, the Moors, the Tuareg, and the Arabs are equally incapable of combined action, except for the solitary purpose of destroying civilisation. They presented a problem which the French have dealt with, and most successfully, not so much by sending out flying columns and building forts, as by making wells and making oases which on the one hand resist the sand storms, and on the other make it possible for the Arab to settle down and lead a quiet life. The manner in which the French have dealt with the country affords a strong argument for placing the management of Morocco in their hands, for the nomad Arabs who are met with there are really a part of the same desert tribes as those to the south of Algeria and Tunis.

The lecturer described a journey he had taken into the Sahara in company with two Europeans, an Algerian and six Arabs, mounted on pack mules. Starting from Biskra they went south to Tugurt, then across the sand dunes to El Oued and back again to the coast. This part of the lecture was illustrated by a series of some ninety slides from photographs taken on the way.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, May 19th.

H. W. O. Hagreen, Esq., gave a lecture on "The Englishman's home past and present."

A vote of thanks to the lecturer was proposed by the President.

Saturday, June 2nd.

O. H. Latter, Esq. gave a lecture on "Insects I have known."

The lecturer started by showing some slides of different species of wasps and also of flies which resembled them in every detail. We went on to explain the modes of nesting and breeding adopted by the queen wasp and how the workers were reared. The queen forms its nest of a series of cones which are gradually built up one outside the other to keep in the warmth. The eggs are laid on top of the cones, and glued to the inside by the queen. When the grubs are hatched they find themselves hanging head downwards from their eggs and have to keep themselves up for about a week by hooking on to the egg shell with their tails. In this position they are fed till they grow so fat that they cannot fall out.

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When a sufficient number of wasps are bred to fill the inner cone, they eat it away and make another outside to replace it. Thus a nest is continually growing in circumference.

The lecturer then left the ordinary wasp and explained the behaviour of the 'Sand Wasp.' These insects make small holes in the sand and in these they place caterpillars, spiders, or flies, according to their species. The egg is laid in the hole and covered up completely with sand; when it hatches out the grub feeds on the food it which finds provided. Only in one case had the lecturer known a wasp of this kind to return and supply caterpillars to its grub; usually the grub has to manage with its first provision. The lecturer thence proceeded to the 'Mud Wasp.' This interesting insect builds its nest entirely of mud, leaving an open space in the centre into which it drags about a dozen caperpillars. It then lays its egg suspended by a fibre from the top of the cell, that it may not be injured by the caterpillars, which do not die for some time but are almost completly paralysed. The grub feeds on these until it is old enough to dig its way out. The lecturer only found time to speak of one other species of wasp, the 'Pompilus,' which much resembles the Sand Wasp in its actions, but its colouring is like that of a fly thus enabling it to prey upon that insect. A curious feature about it is that it drags its victim into its hole by means of its sting, in which method it is quite unique.

A vote of thanks to the lecturer was proposed by Mr. FitzGerald.

Saturday, June 30th.

W. Ramsden, Esq., M.D., gave a lecture on "Bubbles and Surface films."

Dr. Ramsden commenced his lecture by describing the bubble, pronouncing it to be a thin film of water enclosing an air space. Water being a fluid, yields to any force, however small, and the power of various limpid liquids to form fairly durable thin films is a highly remarkable one, quite inconsistent with the view that the film retains the properties of liquid in bulk. No serious attempt had hitherto been made to show the factors on which bubble-forming power depends. The lecturer exhibited experiments which he regarded as proving that every bubble-forming liquid held solid particles in solution or suspension which spontaneously collected at any air-surface until that surface had become thickly studded with them. In Bubble-films each air-surface was coated with solid particles while between the two surface layers was placed the solution from which they had migrated. The

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properties of bubble-films were entirely consistent with and admirably explained by this hypothises.

The lecturer concluded by showing that a bubble of oil could be made in a vessel of water and with water inside.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, October 6th.

S. A. Saunder, Esq., gave a lecture on "Nebulæ and what we learn from them."

When a moderate sized telescope is pointed towards the Milky Way it is found that the light really comes from an immense number of small stars, too small and too close together to be separated by the unaided vision. But the same telescope shews also small hazy patches which it is unable to resolve into stars. As the power of telescopes increased it was found that more and more of these patches were really clusters of stars, until some thought that with sufficient power they would all prove to consist of stars. But when the spectroscope was invented it was found that the light from many of these Nebulæ consisted of bright lines shewing that it came from a glowing gas. One of the best examples of a Nebula of this kind is the great one in Orion, the details of which are so intricate as almost to baffle delineation. A number of slides were shewn giving drawings made by various astronomers and finally some recent photographs. This Nebula is said to have suggested to Sir William Herschel the "Nebular hypothesis," slightly varying forms of which were also put forward independently by Kant and Laplace. According to this theory the Solar System has been formed by the condensation of a nebula which originally extended beyond the orbit of the outermost planet. As this condensed it was shewn that rotation must almost necessarily be set up, and that the angular velocity must increase as the contraction progressed. This was supposed to result in the throwing off a series of rings each of which condensed into a planet, the planets also throwing off rings which condensed into satellites. That there is some foundation of truth in this theory is generally admitted, but nobody thinks now that it contains the whole truth. It has been made almost certain by the researches of Sir George Darwin that the moon was thrown off by the earth in a single piece, and not as a ring; and M. Poincairé has shewn mathematically that a rapidly rotating body may become elongated, and then pear shaped with a contracted ring or waist, dividing it into two unequal parts; but neither he nor Sir George Darwin has yet been able to

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trace the actual process of separation. It has been suggested by Mr. Jeans that the earth is still slightly pear-shaped, the thick end of the pear being situated in Africa, and that under the stresses produced by the gravitation of its parts and its daily rotation it is gradually approximating to a spheroidal shape. The shifting of the parts by which this change of shape is effected is supposed to produce the world shaking earthquakes of which we have recently had such disastrous experience. The lecture concluded with the exhibition of a number of slides of spiral, annular and irregular nebulæ.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, October 20th.

C. W. HIGGINGSON, Esq., gave a lecture on "Land and Sea Frontiers."

The lecturer commenced by pointing out what an excellent protection a sea frontier afforded against invasion, and how much Great Britian owed to its being completely surrounded by water. But his principal object was to trace in the history of the Roman Empire the effect which the neglect of this general principle had had upon the history of the world. Originally, the city had an unsatisfactory land frontier, which rendered it necessary for the Romans to subdue, or make terms with the neighbouring nations, until they obtained dominion over the whole of Italy, and so acquired a satisfactory sea frontier with a short, easily defended line of land frontier on the north. They had, however, a rival power in Carthage, whom they fought, first for the possession of Sicily, and afterwards for Spain. From here they passed over to Africa, and as their way extended over the south of Europe they acquired a long line of land frontier with sea in the middle. This of all conditions was the most dangerous, and their wisest course would have been to retire from Africa altogether and to obtain a frontier from the Baltic to the mouth of the Danube. They might then have concentrated their strength upon the Cimbri and Teutones from whom they suffered such disastrous defeats in B.C. 113, 109, 107 and 105. Marius, Cæsar and Marcus Aurelius all saw something of this, but tradition and the great aversion which all nations have to retiring from territory they have once possessed were too strong for them. The Romans frittered away their strength in small wars across their enormous length of land frontier, and Italy was overrun by the Goths; the Roman empire crumbled to pieces and the advance of civilisation was retarded for centuries.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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Saturday, November 10th.

E. WALTER MAUNDER, Esq., F.R.A.S., gave a lecture on "The Royal Observatory, Greenwich."

The Royal Observatory was founded in the reign of Charles II. for the purpose of constructing tables of the moon of sufficient accuracy to permit of their use in determining longitude at sea. The original Observatory occupied only a small part of the space now covered by the buildings, additions have been made from time to time, the largest of all, the building known as the New Observatory, having, been added by the present Astronomer Royal, Sir William Christie. Entering the gate and turning to the left we find ourselves at once in the transit room. The principal objects which meet our view are two great stone piers, between these is a telescope so mounted that it can move up and down, but cannot be turned the least bit to the right or left. Two large circles are attached, one on each side. One of these is used only for clamping, the other is graduated so as to shew with great accurracy what angle the direction of the telescope makes with the horizon. The circle is 6ft. in circumference, and the divisions on its silver rim are about $\frac{1}{20}$th of an inch apart. The spaces between these divisions are again subdivided by means of six microscopes fixed at different points round the circumference. The Greenwich Meridian, which has been selected at the zero of longitude for practically the whole world, is defined by the optical axis of this telescope. On looking into the eyepiece we see ten fixed vertical wires and one movable horizontal wire. By noting the exact instant at which a star crosses each of these wires we may determine its right ascension, corresponding to terrestrial longitude, and by noting the position of the horizontal wire when the star appears to run along it, coupled with the readings of the six microscopes, we can determine its declination, the co-ordinate which corresponds to terrestrial latitude. In this way the positions of the stars are fixed. The moon has been so carefully observed that its position among the stars at any time can be foretold with great accuracy years before hand. The necessary data are all given in the Nautical Almanac, and so a sailor by carefully observing the position of the moon among the stars can determine Greenwich time from any part of the world. It is a comparatively easy matter to determine the local time by noting the instant at which the sun or a known star crosses the meridian. The difference between these gives the longitude, and thus the problem was solved. Chronometers are now made so perfectly that Greenwich time is always determined from them, and not by observing the moon.

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One of the most important pieces of work carried out at Greenwich is the testing and rating chronometers for use in the Royal Navy.

The introduction of photography has had a great influence upon astronomy. Some years ago a meeting was held in Paris to arrange a plan for photographing the whole sky, and so making a great star catalogue. The work was divided amongst eighteen observatories, six of which are British. Many precautions have to be taken in order to obtain the highest possible accuracy; the plate has always to be in exactly the same position in the telescope, and to ensure this it is pushed out of the dark slide up to a set of stops by means of a strong steel spring. When the exposure is finished the spring is withdrawn and the plate falls back into the slide. At one time it was feared that contractions or expansions might occur in the film and accordingly a résean of accurately ruled squares is printed on the plate. Should any shrinkage occur, the sides of these squares would be distorted. The fear has proved to be groundless, but it has been found that the easiest way to determine the relative positions of the stars is to measure their distances from the nearest résean lines. Photographs of the telescope used in this work at Greenwich were shewn, and the means of controlling the driving clock were explained. Slides were also exhibited of various celestial photographs taken at Greenwich shewing the motion of a minor planet, the sixth and seventh satellites of Jupiter, the nebulæ in Andromeda, Orion, and those surrounding the Pleiades.

There is also much work to be done during the day at Greenwich. One of the most important branches is the distribution of time throughout the country. At 9 o'clock every morning the observer at the time desk receives a note of the observations made the previous night shewing the errors of the clock These are corrected and at 10 o'clock a signal is sent to the Post Office. At one o'clock when the observations have been more completely reduced the time balls are dropped. Then again there is the magnetic observatory where the variations in direction and intensity of the earth's magnetic force are photographically recorded. When these variations are rapid and intense we say that there is a magnetic storm, and these storms are sometimes so violent as to put a stop to telegraphic communication. The sun is photographed every day, and the number, position and size of the spots are carefully studied. These vary very much, and it is found that they rise to a maximum about every 11 years. When the position of a spot is noted from day to day it is found that they all move across the sun's disc in about 28 days, and hence it

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is inferred that the sun rotates on its axis in about 25 days, the other three days being accounted for by the motion of the earth in its orbit round the sun.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, November 24th.

H. W. Monckton, Esq. (O.W.), F.L.S., F.G.S., gave a lecture on "A Norwegian Snow-field and its Glaciers."

The Snow-field named Jostedalsbræ is situated in Norway between 61° and 62° north latitude, that is a little north of the Shetland Islands. The snow-line in that district is about 4,600 feet above the sea, and the snow rests upon a great plateau or table land for the most part above the snow-line in level, the consequence being that the extent of snow is very great, the main mass having a length of some 35 miles, and around it are a great many smaller patches often only divived from the main mass by shallow valleys. The top of the snow-field is 6,495 feet above the sea. In at least one well-known guide book the Jostedalsbræ is described as the largest glacier in Europe; but this is an error, for though it is the largest snow-field in Europe it is not a glacier at all, and none of the glaciers which flow from it are as large as many Swiss glaciers. The mistake no doubt arose from the fact that the Norse word 'Bræ' is used for both a snow-field and a glacier.

The lecturer said he had visited the district in several years and during the last summer had spent six weeks there, and he illustrated his remarks by 66 lantern slides which with two exceptions he had made from photographs taken by himself during his last visit.

Around the snow-fields are a great number of small glaciers which hang on the upper parts of the sides of the valleys, but do not descend any distance, and it seemed that only in certain places were circumstances favourable to the production of a stream of ice which could descend into the valley.

The chief circumstance required was a favourable collecting ground; not merely a flat snow-field, but a surface giving the snow a tendency to converge towards a point, and further, it was needful for there to be a tolerably well defined valley running somewhat back into the snow-field for the converged snow to travel down.

The lecturer gave a detailed account of the Suphellebræ, showing the circus-like collectiug ground near the Suphelle Nipa, and then tracing the course of the ice down the valley into Suphelledal. On the steep side of Suphelledal the continuity of the ice is broken by a steep cliff, and the lower part

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at the bottom of the cliff is a re-cemented glacier, formed of ice-fragments which fall from the upper part. The foot of the re-cemented glacier is 170 feet above sea level.

The Bojumsbræ was next described. It is, in the lecturer's opinion, the most imposing of the glaciers of the district. It is a continous stream of ice from the snow-field down to a level of 492 feet above the sea.

Both the Suphellebræ and the Bojumsbræ flow from the south-east side of the snow-field.

Passing to the north-west side of the snow-field the lecturer described the Lundebræ, which flows into the valley of the Jölster Lake, and also gave some account of the gravel terraces of the river Jölster, between the lake and the Förde fjord. The ice-markings along the fjord show that during the climax of the Glacial Period a glacier flowed down the valley far beyond Förde, and probably down to the open sea, and the vast accumulation of gravel and sand between the lake and Förde must consequently have been deposited since the retreat of the glacier from the fjord, and since the climax of the Glacial Period.

The Melkevoldbræ, the Briksdalsbræ and the Aabrekkebræ, all of which flow from the snow-field into the valley of the Olden Lake, were then described. Though fine glaciers they do not descend below the 1,000 feet contour. The last of these is celebrated as having advanced as much as 4,000 metres during the period 1700—1740, and destroyed some farms.

All the glaciers of the district have retreated greatly in recent years, though occasionally small advances occur. At the present time they are making a slight advance, and it will be intersting to see how long the advance continues.

Finally the lecturer dealt with the Kjendalsbræ which flows into the valley of the Löen Lake.

A vote of thanks to the lecturer was proposed by Mr. Eustace.

Saturday, December 8th.

A. W. ANDEWS, Esq., F.R.G.S., gave a lecture on "British Mountain Scenery."

The lecturer commenced by shewing some views of Snowdon and other Welsh mountains. Evidence of the action of former glaciers was pointed out in the smooth rocks and in some of the mountain tarns. Other views illustrated the carrying power of glaciers, rocks being shown in positions to which they could have been brought by no other known means. A number of views were shewn to illustrate the difficulties encountered in climbing some of these mountains

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and the means by which they may be overcome. Some photographs of rocks on the Cornish coast afforded illustrations of the method of climbing what is known as a chimney, a narrow vertical passage between two rocks, in which the climber supports himself by pressing against both walls at the same time. Those fond of climbing may find amongst our English mountains bits which are quite as hard to surmount as anything in the Alps, and much ingenuity may be exercised in finding different paths for ascent. The lecturer shewed one hill which he had ascended 10 times, and each time by a different route. In conclusion he exhibited a number of views of some of the most beautiful peaks in the Alps.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Tuesday, February 6th.

At a P.B.M., H. S. Brabant, Esq., and Rev. T. F. Royds were elected Honorary Members.

W. H. Croome, R. S. Leach, G. S. Harris, C. L. Brereton, A. R. P. Hoffmann, C. G. Y. Skipwith, H. C. Christopherson, L. J. C. Southern, V. E. Guinness, W. B. Loveless, K. F. P. Mackenzie, C. R. Horley, M. A. B. Johnston, H. H. Nash, F. E. Soames, W. H. L. O'Neill, E. L. Paske, J. P. Duke, L. G. Murray, I. P. W. Bennett, S. H. V. Neck, L. E. Poynder, J. C. Olphert, G. Tayleur, M. W. Huish, C. F. S. Jameson, E. Latham, N. I. MacWatt, A. J. S. Hammans, R. G. W. Rimington, H. K. West, C. C. Mitchell, C. F. R. Hanbury Williams, P. S. Campbell, N. R. La F. Whittall, E. J. Howard, G. C. Mostyn Owen, F. A. Phillips, R. F. Markby, R. V. Burke, H. R. Barkworth, E. M. L. Ainslie, A. C. Parker, C. E. Wales, R. G. Cazalet, R. W. Hnghes, R. A. Grey Wilson, C. C. Dugdale, F. H. Davidson, R. Gough, E. S. Buckley, W. F. Loudon, E. J. Shearer, were elected Associates.

At a Committee Meeting, H. P. A. Hagreen was elected a Member.

Wednesday, May 16th.

At a P. B. M., P. K. Boulnois, A. L. de Cordes, F. A. H. Castberg, C. T. A. Pollock, W. S. Howard, L. Jones Bateman, R. A. Mackean, E. A. H. Mackenzie, G. J. D. R. Cruden, G. C. Wynne, R. C. S. Butler, R. G. W. H. Stone, R. G. A. Thorne, G. Cheetham, P. B. Lees, R. G. Fenwick, H. M. Heyder, W. C. Wilson, N. R. Daniell, H. M. Heyland, C. Sykes Banks, G. M. Thompson, D. F. de Wend, A. G. Menzies, S. P. Whitfield, F. H. R. Lawson, F. M. Fox, C. M. Beazley, M. L. Loveless, D. B. Mein, R. F. A. Gavin, H. R. F. Sullivan, R. R. L. Thom, J. E. M. Mellor, P. R.

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Hughes, J. A. Childe Freeman, K. F. W. Dunn, J. R. Holland, T. Barry, W. M. Cliff, H. A. Tyler, J. A. Turner, W. E. Loveless, G. E. Gott, O. S. Cumming, H. G. Watkin, J. B. Morgan, D. W. Baring, T. G. P. Roupell, G. S. Dyer, Hon. R. H. B. Norton, H. V. Spankie, G. C. H. Crawshay, E. A. Spencer, R. J. Stewart, F. S. Poynder, G. N. Paget, R. F. Cooper, T. G. Tindal, were elected Associates.

R. E. Parsons and E. F. A. Hay were elected Judges for the Pender Prize.

At a Committee Meeting H. V. White was elected a Member.

Monday, October 1st.

At a P.B.M., votes of thanks were accorded to R. E. Parsons and E. F. A. Hay, the retiring Secretary and Treasurer.

L. Lawrence Smith was elected Secretary.

R. A. Peters was elected Treasurer.

J. H. E. Shearme, G. H. J. Harries, J. L. Beddington, L. Errington, H. A. W. Pearse, F. A. Phillips, W. G. Patten, C. E. S. Beatson, G. A. K. Lawrence, H. W. B. Foster, P. Grey, D. A. Campbell, J. H. Tristram, D. F. Massy, W. A. L.Thorne, C. A. Charlwood Turner, J. L. Fetherstonhaugh, R. A, V. ffrench, J. F. Glass, C. E. Wales, R. C. Fish, S. W. Thompson, N. S. Collier Johnston, R. St J. Blacker Douglass, T. M. Lovett, R. C. Matthews, J. C. Joubert de la Ferté, G. R. H. Wallace, J. W. S. Galbraith, G. S. Walker, R. G. Wilson, were elected Associates.

At a Committee Meeting, R. L. Atkinson, F. G. G. Willoughby, H. S. Pinder were elected Associates.

Saturday, November 17th.

At a P.B.M., G. F. Welch, D. A. Williamson, H. J. Eller, E. W. T. Agar, K. F. M. Power, D, M. Sealy, A. B. Turner, were elected Associates.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time, until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus, chosen by the winner, subject to the approval of the President.

The winner may, if he choses, add to be value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President, and obtain his sanction, before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some

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branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1906 was awarded to W. E. Pain for an Essay on "The Raven."

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the Society, for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). More credit will be given for collections illustrating the life history of particular species, *e.g.*, larva in different stages, pupa and imago, than for collections showing only the final stage of development, *e.g.*, butterflies and moths. Each collection must be accompanied by a note-book giving dates and localities for all the specimens, and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize value 10s., will be given by the N.S.S.

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III. One or more prizes are offered by the N.S.S. to Members and Associates for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1906, the prize in Group I was awarded to F. A. Phillips.

In Group II the prizes were divided between L. Lawrence Smith, and H. V. White. An extra prize was awarded to H. S. Pinder.

In Group III the first prize was divided between E. F. A. Hay, and J. H. Hay. An extra prize was awarded to C. G. Y. Skipwith.

Photographic Prizes.

Mr. Blundell offered a prize, value £1, to Members of the Photographic Section, for the best photographs of Natural History subjects. This was awarded to J. H. Hay.

Mr. Longland offered a prize for the best photographs of Birds' Nests, Eggs and Young Birds. This was awarded to A. R. P. Hoffmann.

Mr. Perkins offered a prize, for the best enlargement, or series of enlargements, made by Members of the Photographic Section during the Michaelmas term. This was divided between J. H. Hay and R. C. Money.

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KNOT. E. F. A. Hay.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·85	43·9	27·2	29·4	28·8	89	10	·08	E.
2	·74	43·7	28·4	43·1	42·9	98	10	·33	S.
3	·46	50·2	37·4	43·7	43·7	100	10	·12	S.E.
4	·61	50·4	42·7	46·9	46·7	99	10	·32	S.W.
5	·77	51·9	45·3	47·1	46·9	99	10	·46	S.
6	·31	45·9	42·5	44·1	41·9	83	10	trace	W.
7	·72	46·9	35·8	39·9	39·3	95	3	·18	S.W.
8	·26	47·9	39·2	43·9	42·7	98	8	·05	S.W.
9	·41	51·9	35·3	46·2	46·1	99	10	·08	S.W.
10	29·55	46·1	37·2	41·5	39·4	83	0	·01	S.W.
11	30·12	46·9	27·7	38·7	37·7	91	0	·25	S.
12	29·79	52·1	38·2	44·7	44·2	96	10	·60	S.
13	29·68	48·1	42·2	44·1	43·2	93	10	·02	N.W.
14	30·10	51·9	34·3	41·2	39·5	86	0		N.W.
15	29·90	46·1	40·4	44·4	42·2	83	10	·13	N.W.
16	·90	49·1	35·3	42·1	41·2	93	8	·52	S.W.
17	·92	47·7	36·8	39·4	38·1	89	10	·24	S.W.
18	29·49	48·9	38·5	47·5	47·2	98	10	·03	S.W.
19	30·10	42·5	35·3	40·1	37·4	79	10		S.W.
20	·53	43·1	24·5	35·1	31·6	68	5	·03	S.W.
21	·05	44·9	34·6	41·6	41·1	96	8	·02	N.W.
22	·45	38·9	28·4	35·9	35·0	92	10		N.
23	·60	40·1	22·5	31·7	30·0	79	10		N.E.
24	30·47	47·1	25·0	34·4	32·3	79	10	·34	S.
25	29·79	49·7	33·3	46·1	45·7	97	10	trace	S.
26	29·96	53·6	38·2	49·1	47·8	91	10	trace	S.
27	30·15	53·9	42·2	46·7	45·4	90	10		S.W.
28	·16	48·1	44·5	47·2	45·1	85	10		W.
29	.12	51·2	45·0	47·2	45·4	87	10	·06	S.W.
30	·33	48·2	28·4	43·1	41·4	94	4	trace	S.W.
31	30·38	48·5	29·4	40·2	39·9	97	8	trace	N.W.
								Total	
Mean	29·92	47·7	35·3	42·1	41·0	91	8·2	3·87	
Mean for 24 years	29·97	43·6	32·6	37·9	37·0	90	8·3	2·05	

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FEBRUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·23	48·4	40·1	44·2	44·1	99	10		N.W.
2	30·06	48·2	35·3	47·7	43·1	69	8	·12	N.W.
3	29·72	40·5	37·7	38·7	38·4	97	10	trace	N.W.
4	29·96	39·4	32·3	34·6	31·6	72	0		N.
5	30·21	40·7	30·5	33·9	32·8	88	8		N.
6	·24	38·9	23·3	36·1	32·1	66	0	trace	S.
7	30·33	42·9	29·3	36·9	36·2	93	10	trace	S.E.
8	29.88	44·9	28·8	42·2	41·1	91	10	·15	S.W.
9	·78	46·7	28·5	33·1	32·1	88	10	·14	N.E.
10	29·21	47·4	27·4	46·2	45·5	94	10	·11	S.W.
11	28·89	45·1	35·5	38·1	37·3	93	5		S.W.
12	29·45	40·7	27·4	33·9	31·1	72	2		N.W.
13	·42	39·9	25·5	37·1	35·0	82	10	·08	N.W.
14	·61	41·2	25·5	39·1	38·1	91	0	·08	S.W.
15	·61	45·9	31·8	39·1	38·7	96	10	·10	S.W.
16	·54	48·3	32·3	40·7	40·1	95	10	·36	S.W.
17	·60	41·1	39·7	40·9	40·7	98	10	·35	N.E.
18	·83	43·4	35·7	38·1	37·1	91	10	·07	N.E.
19	29·72	43·7	34·9	40·7	40·1	95	10	trace	S.
20	30·02	46·7	33·5	41·9	38·2	72	8		S.
21	·18	46·1	25·7	38·9	36·8	84	8		S.
22	30·02	45·4	22·5	37·4	34·0	71	6	·08	S.E.
23	29·52	36·9	31·8	33·4	33·0	94	10	·02	S.E.
24	·68	45·4	25·3	34·3	31·8	75	10	·09	S.W.
25	·41	50·2	33·5	45·3	42·9	82	5		W.
26	·48	48·1	35·3	43·1	41·3	86	10	·09	S.W.
27	·18	46·4	38·2	41·7	40·2	88	6	trace	S.W.
28	29·82	46·7	30·6	35·7	33·3	78	5	·01	N.
								Total	
Mean	29·73	44·3	31·4	39·0	37·4	85	7·5	1·85	
Mean for 24 years	29·98	45·3	32·5	38·4	37·2	88	7·8	1·79	

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MARCH.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·77	50·1	35·2	45·7	44·2	87	10	·02	S.W.
2	29·76	49·9	44·4	49·9	48·3	89	10	trace	N.E.
3	30·41	49·7	23·8	39·1	37·3	86	10		N.E.
4	·36	56·2	32·4	41·9	41·9	100	5		W.
5	·08	56·9	32·0	45·2	43·5	87	10		S.W.
6	·31	64·2	44·3	56·1	51·6	73	6		S.W.
7	30·30	63·9	42·0	59·5	53·2	64	6		S W.
8	29·92	49·4	43·0	48·7	47·3	89	10	·16	S.W.
9	29·87	47·4	37·7				8	trace	S.W.
10	30·02	48·1	33·8	43·2	40·7	82	10	·35	S.W.
11	29·53	50·4	39·5	47·6	46·8	94	10	·07	S.W.
12	·36	50·3	33·0	37·3	35·2	81	10	·12	N.W.
13	·85	34·9	24·5	30·5	29·6	86	10	·12	N.E.
14	·88	53·2	29·9	34·3	33·6	92	10	·03	N.E.
15	·92	55·9	33·2	52·9	52·5	97	10	trace	S.W.
16	29·99	56·9	47·0	53·1	52·3	94	10		S.W.
17	30·08	64·5	44·0	56·5	56·3	99	0		S.W.
18	29·94	50·2	37·1	45·7	43·2	82	10	·04	S.W.
19	30·08	44·9	34·4	40·6	39·9	94	7	·02	N.
20	·31	45·8	33·2	40·4	40·2	98	10	·05	N.E.
21	·04	43·2	34·5	39·9	39·7	98	8	·06	N.E.
22	30·12	41·9	27·9	37·5	36·1	87	5		N.E.
23	29·89	41·1	20·2	38·9	38·4	95	8	·09	N.E.
24	·70	38·1	30·3	34·1	33·8	93	10	·07	N.E.
25	·61	43·6	31·9	36·9	36·6	97	8	·28	N.
26	·70	41·7	26·8	33·2	31·6	81	10	·03	N.E.
27	29·90	43·5	31·3	37·1	33·8	73	10	trace	N.E.
28	30·05	46·2	28·2	42·9	42·1	94	5		N.E.
29	·07	48·2	27·4	44·9	42·2	80	8		N.E.
30	·22	48·2	21·4	39·9	35·9	70	10		N.E.
31	30·27	51·4	37·2	44·9	41·5	76	10		E.
								Total	
Mean	29·98	49·3	33·6	43·3	41·6	87	8·5	1·51	
Mean for 24 years	29·88	49·5	33·5	41·9	39·9	83	7·4	1·83	

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APRIL.

Date.	Barom. reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·40	51·3	39·0	44·1	41·5	81	10		N.W.
2	·49	53·9	30·9	44·4	40·4	84	8		E.
3	·47	61·8	31·3	53·7	44·9	51	0		E.
4	30·18	57·8	34·3	52·5	42·5	46	0		N.W.
5	29·82	60·1	37·3	57·5	49·0	54	8		N.W.
6	30·28	60·8	36·8	54·4	45·7	52	5		N.E.
7	·45	61·0	27·8	55·1	46·7	54	0		S.E.
8	·46	61·6	34·8	50·7	45·6	67	10		N.E.
9	·58	60·0	40·0	50·3	44·2	62	0		N.E.
10	·38	65·0	30·8	55·5	49·0	63	0		N.E.
11	·24	70·9	34·3	62·2	60·5	90	10		E.
12	·13	73·2	38·2	68·1	67·0	94	0		N.E.
13	·06	71·1	38·4	54·1	52·5	89	2		S.W.
14	·44	58·6	40·7	46·7	44·1	81	5		N.
15	·58	59·0	24·2	48·4	41·5	58	0		N.
16	30·34	65·2	27·0	49·7	48·0	89	5		N.E.
17	29·91	59·8	30·1	43·7	42·5	90	5	·10	N.
18	·71	45·2	37·2	41·6	39·1	80	10		N.E.
19	·71	51·3	36·5	40·1	38·1	84	10		N.E.
20	29·96	54·6	25·5	44·5	42·4	84	10		W.
21	30·04	60·1	38·7	50·7	47·4	78	10	·05	S.W.
22	29·91	56·1	37·2	48·9	47·2	89	6		S.W.
23	30·08	50·2	30·1	46·9	46·7	99	10	·03	N.E
24	29·98	53·5	27·9	42·7	42·4	98	10	·05	N.E.
25	·87	48·2	35·8	43·4	41·7	87	10		N.E.
26	·59	49·9	24·7	45·9	45·1	94	10		N.
27	·79	55·9	25·4	48·1	47·0	92	10	·19	N.
28	·41	60·0	41·5	47·2	44·2	66	6	·03	N.E.
29	·36	50·9	27·6	44·2	40·7	75	6	·10	N.E.
30	29·44	50·9	30·5	42·5	42·1	97	8	·10	N.
								Total	
Mean	30·07	57·9	33·2	49·6	45·7	74	6·1	·65	
Mean for 24 years	29·89	55·8	36·8	48·0	44·5	77	7·9	1·41	

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MAY.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·61	54·2	30·1	46·7	45·2	88	8	·04	N.
2	·73	56·9	30·5	44·1	43·7	97	10	·09	N.E.
3	·78	57·0	43·5	54·1	49·5	71	8	·06	S.W.
4	29·91	59·1	45·4	55·2	51·3	76	10	·02	S.W.
5	30·20	58·6	32·5	54·1	48·3	65	10	·11	S.W.
6	·09	57·0	46·1	50·7	49·5	92	10	·02	S.W.
7	·17	68·9	50·0	56·9	55·4	90	10		S.W.
8	30·02	75·9	39·8	68·7	60·9	95	0	·52	S.W.
9	29·83	62·8	50·2	54·9	54·3	94	0	·01	N.E.
10	·71	53·4	44·2	46·2	44·7	89	10		N.
11	·73	66·0	41·2	52·1	50·3	88	10		N.E.
12	29·83	69·3	42·8	65·4	56·5	56	10		N.
13	30·03	74·4	45·9	64·2	57·2	63	0		E.
14	29·94	66·9	45·4	59·9	51·3	55	0		N.E.
15	·79	59·8	40·4	50·1	44·2	67	8	·05	N.E.
16	·60	56·8	42·4	48·4	45·7	81	8	·06	S.W.
17	·51	52·7	39·2	44·5	40·5	55	10		S.W.
18	·56	57·8	29·3	51·2	43·9	57	10		S.W.
19	·69	62·4	31·3	57·7	50·8	62	8		S.
20	·72	51·4	38·4	49·9	45·6	72	10	·30	N.W.
21	·84	51·8	41·2	50·2	46·7	76	10	·01	N.E.
22	·32	65·0	41·5	49·7	44·7	68	10	trace	N.
23	·78	65·4	45·5	64·9	56·6	58	10	·15	S.W.
24	29·79	61·6	50·2	60·4	55·8	73	10		S.W.
25	30·03	60·8	41·7	58.1	50·2	57	10	·24	S.W.
26	29·88	59·3	43·2	50·7	50·5	97	10	·30	S.
27	29·93	64·1	50·2	56·7	56·2	97	10	·06	S.W.
28	30·01	70·9	53·0	61·1	58·9	86	10	trace	S.W.
29	·11	71·9	55·2	64·9	64·2	96	8		S.W.
30	30·07	66·9	47·3	59·7	54·3	69	10	trace	S.E.
31	29·73	61·8	49·1	59·1	55·3	77	10	·06	N.
								Total	
Mean	29·83	61·9	42·8	55·2	51·1	76	8·3	2·10	
Mean for 24 years	29·95	60·2	42·4	54·3	49·9	74	6·9	1·77	

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JUNE.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·57	60·8	43·0	54·9	49·3	66	6	·01	N.W.
2	29·94	61·6	42·2	55·4	51·8	77	10	.02	N.W.
3	30·19	68·4	43·6	55·9	53·6	85	5		N.W.
4	·33	61·8	41·4	60·2	54·2	66	3		N.
5	·38	63·6	33·1	52·9	49·4	77	2		N.E.
6	·33	70·1	35·1	60·3	59·4	94	0		N.
7	·26	72·4	36·3	64·9	64·7	99	0		N.
8	·26	73·9	41·2	68·1	61·4	65	0		N.
9	·26	71·7	47·9	66·7	59·9	64	4		N.E.
10	·28	69·3	40·4	58·4	55·8	84	2		N.E.
11	·27	68·4	40·7	50·7	49·2	90	10		N.E.
12	·19	71·1	41·2	62·9	59·4	80	4		N.
13	·12	61·0	47·7	60·1	59·4	95	6		N.E.
14	·13	58·0	45·4	55·4	50·0	68	10	·03	N.E.
15	·01	56·8	44·0	50·7	49·8	94	10	·08	N.E.
16	·07	59·8	42·7	53·9	49·8	75	10	·34	N.E.
17	·00	64·8	47·9	54·5	52·8	89	8	trace	S.
18	·16	71·1	43·7	59·7	56·8	82	5		S.
19	·30	74·7	44·2	69·9	59·7	53	0		S.E.
20	·41	77·1	47·1	70·9	60·4	52	0		S.E.
21	·38	75·2	55·2	68·2	63·7	76	10		S.W.
22	·21	75·9	57·3	69·2	63·8	71	8		S.W.
23	30·05	80·1	51·2	74·5	65·1	57	5	·08	S.W.
24	29·90	70·4	58·1	59·9	58·2	90	10		S.W.
25	30·18	69·9	53·6	61·7	58·3	80	10		W.
26	·09	70·9	56·5	67·7	62·9	74	8		W.
27	30·06	73·1	50·2	67·3	63·9	81	10		W.
28	29·89	70·1	58·7	62·4	58·1	76	10	2·04	S.W.
29	29·94	58·0	46·4	48·5	48·2	98	10	·02	N.E.
30	30·10	63·4	37·2	57·7	52·8	71	10		S.E.
								Total	
Mean	30·14	68·1	45·1	59·2	56·7	78	6·5	2·62	
Mean for 24 years	30·05	68·1	47·5	60·1	55·6	75	7·0	2·07	

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JULY.

Date	Barom. Reduced	Thermometers Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain	Wind.
	In.	°	°	°	°	°/。	0—10	In.	
1	30·09	66·2	38·2	55·6	51·4	74	2		W.
2	·11	69·9	41·4	60·2	56·2	76	10		N.W.
3	·13	69·9	44·4	64·1	59·9	76	10		N.W.
4	·13	73·9	44·4	68·4	61·7	65	10		N.W.
5	·02	75·6	41·4	71·1	66·1	74	0		N.E.
6	·07	74·1	54·6	71·9	64·9	65	0		N.E.
7	·07	74·5	52·0	65·4	64·2	93	10		S.W.
8	·19	73·7	49·8	62·9	60·1	83	10		W.
9	·30	71·9	47·2	65·9	61·2	75	5		S.W.
10	·19	69·9	52·0	66·7	60·7	68	2		S.W.
11	·21	65·0	47·2	62·7	61·9	95	10		S.W.
12	·22	65·0	47·3	58·8	55·4	80	10		S.W.
13	·12	68·3	41·4	64·9	59·9	72	10		S.W.
14	·08	74·7	55·0	67·2	63·1	78	5		S.W.
15	·03	69·2	52·0	62·1	58·9	81	10		W.
16	·06	72·9	48·1	64·4	59·4	72	8		S.
17	30·12	76·1	59·3	72·4	64·9	63	10		S.W.
18	29·99	79·9	55·5	66·2	62·2	78	0	·19	S.W.
19	·91	65·0	56·0	57·5	56·2	91	10		S.
20	29·93	67·3	48·1	57·4	54·3	82	10		S.
21	30·02	68·6	43·2	58·1	54·6	79	10		S.
22	·04	71·2	57·9	68·5	65·5	83	10		W.
23	·03	78·9	59·1	71·9	67·6	78	10		S.W.
24	·03	69·2	55·3	65·7	58·3	62	6		S.W.
25	30·19	76·2	43·2	68·7	62·7	73	10		N.E.
26	29·99	78·1	49·1	72·9	64·1	58	3	·09	S.
27	·88	75·9	55·6	72·2	70·6	91	10	·03	S.
28	·99	73·6	49·4	69·1	58·9	53	0		S.W.
29	·97	75·9	58·0	62·9	59·7	81	10		W.
30	·96	83·9	50·5	75·7	67·0	61	0		S.E.
31	29·94	78·9	56·8	70·4	62·4	61	2		S.E.
								Total	
Mean	30·01	72·7	50·1	65·9	61·4	75	7·2	·31	
Mean for 24 years	29·99	71·0	51·4	63·5	58·9	75	7·0	2·05	

AUGUST.

Date.	Barom. Reduced	Thermometers. Max.	Min	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In	°	°	°	°	°/o	0—10	In.	
1	30·12	78·4	49·6	68·4	58·8	54	8		S.W.
2	29·96	82·4	56·5	74·9	65·7	58	10		S.W.
3	29·83	72·9	59·1	68·1	64·7	81	10		S.W.
4	30·06	72·1	53·5	67·4	63·4	78	5		S.W.
5	·27	85·3	53·0	67·8	64·7	83	8		S.W.
6	·26	78·9	56·0	69·7	53·8	70	5		S.E.
7	·15	79·9	53·2	76·1	67·3	60	5		S.E.
8	30·00	83·7	54·0	78·2	69·3	60	2		S.E.
9	29·95	73·5	52·8	67·7	60·9	65	6		S.E.
10	·85	70·2	55·0	67·2	63·4	79	10	·03	S.E.
11	·84	69·2	52·3	64·2	62·7	91	8		S.W.
12	·96	75·1	52·2	65·1	62·2	82	10		S.W.
13	·71	75·4	58·4	74·9	65·9	59	6	·30	S.W.
14	·71	67·9	53·5	65·9	60·2	70	10	·03	N.W.
15	·78	68·9	52·5	64·4	58·4	68	10	·03	N.W.
16	·91	66·2	49·3	61·7	56·2	70	10	·02	N.W.
17	·87	66·3	51·8	65·5	57·7	60	8	·12	S.W.
18	29·99	64·0	49·0	61·2	55·5	69	8		W.
19	30·21	66·9	48·2	57·1	51·5	68	10		W.
20	·16	74·4	47·1	64·5	60·4	77	10		W.
21	·18	77·1	61·1	72·9	66·7	69	8		S.W.
22	30·05	85·9	55·3	76·7	68·8	63	0		S.W.
23	29·96	80·1	54·1	63·2	60·1	94	6	·03	S.W.
24	30·00	75·3	60·1	64·1	63·1	94	10	·20	S.W.
25	29·77	68·1	57·6	62·9	59·4	79	10		S.W.
26	30·17	72·2	52·2	60·3	58·2	87	10		W.
27	·26	74·7	58·5	67·9	65·4	85	5		N.W.
28	·43	71·4	45·7	62·5	57·0	69	2		S.W.
29	·32	76·1	38·9	60·7	56·4	75	0		E.
30	·17	83·9	39·5	55·9	55·8	99	0		N.E.
31	30·12	91·2	50·5	74·7	64·6	55	0		S.E.
								Total	
Mean	30·04	75·4	52·9	65·9	61·0	73	7·1	·76	
Mean for 24 years	29·96	70·2	50·8	62·3	58·2	77	6·9	2·14	

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SEPTEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humility.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/₀	0—10	In.	
1	30·12	92·6	54·0	77·9	67·0	53	0		S.E.
2	30·04	92·2	58·6	78·9	65·6	46	0		S.
3	29·99	85·6	49·5	73·8	63·7	55	0		S.E.
4	30·19	74·9	54·3	63·1	60·7	85	10	·52	N.E.
5	·17	71·1	52·8	56·8	56·0	94	10		N.W.
6	·01	72·9	56·0	62·9	60·4	85	10		W.
7	·18	73·1	60·9	63·3	61·2	88	10		S.W.
8	·14	78·2	49·0	57·1	56·6	97	10		W.
9	·27	67·8	56·2	59·8	54·2	68	10		N.W.
10	·34	59·8	40·9	56·4	51·4	70	2		N.E.
11	·37	68·6	32·8	53·7	50·8	81	0		N.W.
12	·24	66·3	42·7	54·6	53·2	90	0		S.E.
13	30·07	69·1	53·9	63·3	59·2	77	10	·22	S.
14	29·87	67·5	48·6	55·1	53·8	93	5	·29	N.W.
15	·65	63·8	51·8	54·3	50·5	76	5	·06	W.
16	29·87	59·6	40·4	54·3	49·3	69	10	·05	N.W.
17	30·09	63·8	48·5	52·8	49·3	77	10		N.
18	·15	64·0	52·7	57·3	52·8	74	8	·07	E.
19	·18	60·8	52·3	57·7	55·4	86	10		N.E.
20	·23	62·0	48·5	55·9	54·8	93	10		N.
21	·34	63·0	45·1	55·9	54·0	89	10		N.
22	·39	62·8	49·0	59·4	54·6	72	8		W.
23	·44	58·3	42·8	53·6	49·8	76	2		N.E.
24	·43	61·0	45·0	56·3	52·8	78	10		E.
25	·41	61·0	38·2	56·6	50·0	62	2		N.E.
26	·58	60·8	31·3	55·4	51·5	76	10		N.E.
27	·62	64·0	32·8	60·7	54·8	66	10		N.E.
28	·50	65·1	32·5	54·5	52·8	89	10		N.E.
29	·37	63·3	37·2	59·3	54·8	74	10		N.
30	30 24	67·1	42·8	51·9	51·6	98	5		S.E.
								Total	
Mean	30·22	68·0	46·7	59·1	55·9	81	6·9	1·21	
Mean for 24 years	30·03	65·5	47·5	58·2	55·1	82	7·0	1·84	

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OCTOBER.

Date.	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	30·09	70·1	44·4	58·1	56·8	91	2	·45	S.E.
2	29·72	60·8	57·9	60·4	59·7	95	10	·70	S.E.
3	·87	62·8	54·2	60·6	55·8	72	5		S.E.
4	29·95	64·0	50·2	62·6	57·7	73	8	·14	S.E.
5	28·80	64·0	59·3	62·4	59·9	85	10	·01	S.E.
6	30·03	64·6	47·1	61·1	56·8	76	5		S.E.
7	29·99	63·3	54·0	61·6	59·6	88	10	·19	S.W.
8	·84	63·8	50·2	61·3	56·0	71	5	·68	S.W.
9	·83	62·8	49·9	57·3	56·8	97	10	·30	S.W.
10	·83		51·5	62·9	61·1	89	8		S.
11	·77	67·1	52·8	60·9	59·4	91	8		S.
12	.80	63·8	48·8	58·4	54·4	76	10	·06	S.E.
13	·60	53·9	48·1	50·3	48·6	89	10		N.E.
14	·87	53·7	34·8	42·5	38·9	73	0	·02	N.
15	·86	60·0	34·3	53·6	52·2	90	10		S.W.
16	·75	61·4	49·0	56·1	52·3	76	10	·07	S.W.
17	·86	59·8	50·0	53·4	52·5	94	10	·20	S.W.
18	·79	58·8	51·2	58·1	54·3	77	10	1·22	S.W.
19	·79	55·1	40·4	51·1	47·5	76	8		S.W.
20	·91	58·8	33·3	50·1	47·9	85	10	·03	S.E.
21	·95	62·2	49·5	58·9	58·1	94	0		S.
22	29·90	65·0	55·2	61·3	59·4	89	10	·04	S.
23	30·08	63·8	52·0	59·9	58·4	91	8	·02	S.W.
24	·25	62·1	48·1	58·9	57·2	89	10		S.W.
25	·36	55·2	34·5	52·1	50·3	88	0		S.W.
26	·20	55·2	29·4	49·6	48·2	90	10		S.W.
27	30·05	52·4	42·5	50·6	47·4	78	10		S.W.
28	29·81	55·2	36·3	51·9	50·3	89	10	·43	S.W.
29	29·61	51·2	37·4	44·6	41·5	78	7	·62	W.
30	30·21	47·1	39·2	46·1	45·9	99	10	·05	S·E.
31	29·49	50·5	40·2	44·6	43·4	90	10		S.E.
								Total	
Mean	29·90	59·6	45·0	55·5	53·2	85	7·9	5·23	
Mean for 24 years	29·91	56·4	41·2	49·7	47·8	87	7·4	3·09	

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NOVEMBER.

Date.	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	30·06	52·1	40·5	50·3	49·0	91	10	·13	W.
2	29·22	51·9	46·2	47·3	46·5	94	10	·03	N.
3	·33	53·1	34·3	44·7	44·4	97	10	·16	S.W.
4	·33	47·3	32·5	44·6	44·2	95	5	·60	S.E.
5	·50	54·9	42·0	47·4	45·1	83	5		S.W.
6	·65	48·9	29·3	38·6	38·4	98	10	·72	S.W.
7	·38	51·4	37·2	48·7	47·2	89	10	·67	S.W.
8	·38	52·9	46·1	50·3	50·0	99	10	·92	S.W.
9	29·61	52·2	48·3	52·1	49·8	84	10	·03	N.E.
10	30·20	50·1	43·4	48·6	47·8	94	10		S.W.
11	·46	48·7	28·9	35·1	31·5	69	2		N.E.
12	·44	43·9	24·3	32·3	30·8	81	10		N.E.
13	·43	44·9	27·6	39·3	38·5	94	10		S.E.
14	30·32	48·5	34·5	44·6	41·9	80	10		S.E.
15	29.98	50·4	38·0	48·3	47·5	94	10	·17	S.E.
16	·86	52·4	38·4	43·4	42·1	89	10	·38	S.E.
17	·39	49·7	42·0	48·6	47·6	92	10	·16	S.E.
18	·19	47·1	36·6	42·3	41·6	95	10	·10	S.W.
19	·16	43·4	26·9	34·7	32·2	77	10	·06	S.W.
20	·60	54·7	34·3	42·4	37·1	63	0	·22	S.W.
21	29·72	57·1	34·9	54·3	53·5	94	10		S.W.
22	30·32	60·8	52·2	57·1	55·3	88	10		S.W.
23	·52	54·9	48·1	52·9	52·5	97	10	·01	S.W.
24	·52	51·7	46·4	49·3	49·2	99	10		S.W.
25	·51	48·9	45·7	48·8	48·0	94	10		S.W.
26	·46	55·1	39·5	43·3	43·1	98	10		S.W.
27	·07	55·5	42·2	55·1	53·0	87	8		N.E.
28	·19	53·9	37·2	50·1	49·5	96	10		N E.
29	30·18	54·4	47·3	53·3	51·3	86	10		N.E.
30	29·86	54·9	51·0	53·1	51·2	87	10		N.E.
								Total	
Mean	29·89	51·6	39·2	46·7	45·3	89	9·0	4·36	
Mean for 24 years	29·94	49·6	37·2	43·7	42·7	92	8·1	2·62	

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DECEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·00	45·1	37·4	43·7	39·7	72	0	.01	N.E.
2	30·20	52·4	27·8	41·2	40·4	94	10	·04	S.W.
3	29·94	54·2	40·5	50·5	49·8	95	8		S.W.
4	30·09	54·1	47·1	52·4	51·5	94	10		S.W.
5	29·59	45·2	44·8	45·1	42·9	84	10	·15	S.W.
6	29·72	45·9	36·5	41·7	40·1	88	2	·02	N.E.
7	30·34	41·4	30·3	35·7	35·0	94	0		N.E.
8	29·07	44·1	25·6	38·4	35·8	78	10	·16	S.E.
9	·64	39·9	34·9	36·7	35·3	86	10		N.W.
10	·83	36·9	26·5	32·7	30·2	70	0		N.E.
11	·83	46·9	20·5	36·4	35·6	93	10	·09	N.E.
12	·47	44·2	35·9	42·7	42·1	95	6	·12	S.
13	·52	40·4	32·3	36·1	36·0	99	10	·10	S.
14	29·59	40·5	28·7	37·4	34·6	77	3	trace	N.W.
15	30·01	40·5	29·8	36·1	32·3	68	10	·32	N.W.
16	·10	46·3	33·8	40·1	40·1	100	10	·18	S.W.
17	·35	47·6	34·1	44·9	44·9	100	10	trace	S.W.
18	·35	49·1	34·5	47·1	46·7	97	10	·07	S.E.
19	·49	44·1	41·2	42·9	42·7	98	10	trace	S.E.
20	·58	38·1	31·3	33·1	32·3	91	10		S.E.
21	·58	37·1	32·5	36·1	34·8	88	10		S.E.
22	·39	37·1	27·4	33·7	32·8	90	6		N.E.
23	·32	34·1	27·0	27·9	27·4	90	10	·02	N.E.
24	·21	43·9	20·5	33·9	32·3	93	10	·03	N.E.
25	30·84	34·9	27·4	30·1	30·0	98	10	·40	N.E.
26	29·09	33·9	26·9	29·3	29·2	98	10	·07	N.E.
27	·28	33·9	20·5	31·4	31·3	98	5	·06	N.
28	·42	35·1	27·4	32·1	31·8	96	0	·26	N.E.
29	·73	30·9	27·0	28·4	28·0	92	10		E.
30	·73	36·2	25·3	28·1	28·0	98	10	·21	N.E.
31	29·73	42·9	28·4	35·4	35·3	99	8	·05	E.
								Total	
Mean	29·94	41·8	31·1	37·5	36·4	91	7·1	2·36	
Mean for 24 years	29·97	44·2	33·0	38·6	37·7	91	8·2	2·30	

Total rainfall for the year, 26·83 in.
Mean for 24 years, 25·01 in.

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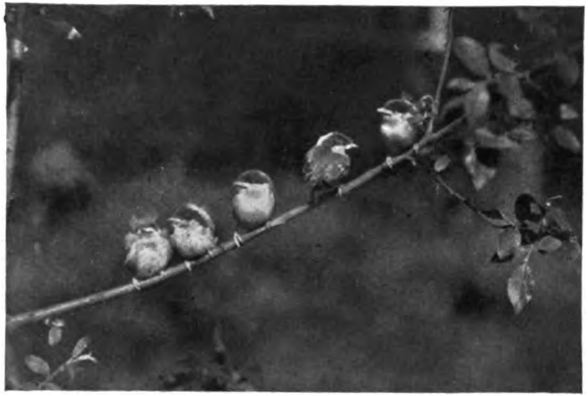

YOUNG COAL-TITS. J. H. Hay.

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PHOTOGRAPHIC SECTION.

1906.

BALANCE SHEET.

RECEIPTS.

	£	s.	d.
Balance	12	6	0
Lent Term—Entrance Fee		1	0
Subscriptions	1	0	0
Easter Term—Entrance Fees		19	0
Subscriptions	1	19	0
Michaelmas Term—Entrance Fees ...		6	0
Subscriptions		19	0
	£17	10	0

EXPENDITURE.

	£	s.	d.
Lent Term—Knight, Hypo		1	9
Glass for Key		5	0
Sweeping		7	6
Easter Term—Knight, Hypo		12	3
Ifould, Repairs, etc		9	6
Glass for Key		5	0
Sweeping		7	6
Michaelmas Term—Knight, Hypo ...		1	9
Glass for Key		5	0
Sweeping		7	6
Balance in hand	14	7	3
	£17	10	0

G. E. BLUNDELL.

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THIRTY-EIGHTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1907.

VIRTUTIS FORTUNA COMES

HEROUM FILII

WISCONSIN ACADEMY OF SCIENCES, ARTS, AND LETTERS

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."

Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1908.

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THIRTY-EIGHTH ANNUAL REPORT

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VIRTUTIS FORTUNA COMES

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"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."
Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1908.

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THE WELLINGTON COLLEGE PRESS:
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Contents.

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RULES.

——:o:——

1. That this Society be called the "Wellington College Natural Science Society."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That all Members of the School be eligible as Associates and that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee and elected by the Members; their names with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other benefactors.

18. That Members and Associates pay a subscription of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

PRESIDENT—S. A. SAUNDER, ESQ.

VICE-PRESIDENTS { J. L. BEVIR, ESQ., H. W. OWEN HAGREEN, ESQ.
REV. H. P. FITZGERALD, G. E. BLUNDELL, ESQ.

SECRETARY { L. LAWRENCE SMITH
B. C. NEWTON

TREASURER { R. A. PETERS
H. R. POLLOCK

DIRECTOR OF THE PHOTOGRAPHIC SECTION—G. E. BLUNDELL, ESQ.

DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, ESQ.

CORRESPONDING MEMBERS.

THE DEAN OF LINCOLN
PROF. T. RUPERT JONES,
B. E. HAMMOND, ESQ. [F.R.S.
H. W. EVE, ESQ.
REV. W. MOYLE
F. R. KITCHENER, ESQ.
PROF. C. J. LAMBERT, F.R.A.S.
E. H. C. SMITH, ESQ.

LIEUT.-COL. W. C. POLLARD, B.S.C.
REV. G. C. ALLEN, D.D.
S. BALL, ESQ.
E. W. WILLETT, ESQ., M.D.
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C. R. HAINES, ESQ.
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H. W. MONCKTON, ESQ., F.L.S., F.G.S.
D. NICOLSON, ESQ., M.D., C.B.

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REV. A. CARR [F.R.A.S.
REV. P. H. KEMPTHORNE,
REV. E. DAVENPORT
F. W. CAULFEILD, ESQ.
W. J. TOYE, ESQ.
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W. D. G. NASH, ESQ.
A. S. TOMLINSON, ESQ.
REV. E. A. DOWNES
REV. W. H. WRIGHT
W. H. KENNETT, ESQ.
R. ST. C. TALBOYS, ESQ.
E. M. EUSTACE, ESQ.
C. A. STOCKEN, ESQ.
H. S. BRABANT, ESQ.

MEMBERS.

Those Members and Associates whose names are marked *p* are members also of the Photographic Section.

L. LAWRENCE SMITH†
p J. H. HAY†
R. A. PETERS†
L. D. G. ALEXANDER
p R. C. MONEY†
H. V. WHITE†

R. L. ATKINSON†
p F. G. G. WILLOUGHBY
p H. S. PINDER†
p H. E. F. CRADDOCK
p H. R. POLLOCK
p G. le Q. MARTEL

p J. E. SHEARER
F. A. PHILLIPS
p C. G. Y. SKIPWITH
p A. F. S. NAPIER
B. C. NEWTON

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F. de V. B. ALLFREY
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H. G. D. CLUTTERBUCK
D. Y. O'M. CREAGH
G. C. H. CRAWSHAY
W. H. C. EDWARDS
J. C. HALLOWES
W. G. HEWITT
E. G. SULIVAN
J. N. MILTON
E. M. MILES
J. F. GLASS
R. C. GUTHRIE SMITH
J. F. B. EWEN
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H. LONGBOTTOM
J. HANBURY WILLIAMS
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A. F. B. HOWARD
J. K. MAITLAND
G. B. LOYD
D. A. L. AINSLIE
D. H. GORDON
E. D. MARRABLE
C. B. WAINWRIGHT
D. M. SEALY
G. W. E. HANMER
V. H. BARNARD
E. E. MacMAHON
L. C. BREITMEYER
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F. E. D. CAMPBELL
M. A. S. RIACH‡
G. S. DYER
L. L. FORWOOD

* Left Lent Term, 1907. † Left Easter Term, 1907. ‡ Left Christmas Term, 1907

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List of the Societies and Journals to whom Copies of the Report are sent.

—:o:—

*Ashmolean N.H.S.
*Cheltenham College N.H.S.
Christ's Hospital N.H.S.
Clifton College N.H.S.
*Dulwich College N.H.S.
*East Kent N.H.S.
*Epsom College N.H.S.
*Felsted School N.H.S.
*Haileybury College N.H.S.
*Harrow School Scientific Society.
King Edward's School, Birmingham, N.H.S.
*Malvern College N.H.S.
*Marlborough College N.H.S.
*Rugby School N.H.S.
*Uppingham School N.S.S.
Winchester College N.H.S.
British Museum (Natural History).
Geological Survey Office.
Linean Society.
Royal Meteorological Society.
*U.S. Geological Survey Office.
*Chicago Academy of Sciences.
*El Instituo Geologico de Mexico.
*Cuerpo de Ingenieros de Minas del Perú.
*University of Montana.
*Wisconin Academy of Sciences, Arts and Letters.
Nature.

* Those marked with an asterisk exchange reports with us.

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ACCOUNTS.

RECEIPTS.

	£	s.	d.
Balance in hand	113	1	8
Subscriptions :—			
Lent Term—Honorary Members ...	5	5	0
Members and Associates	5	3	0
Easter Term—Honorary Members		6	0
Members and Associates	7	15	0
Michaelmas Term—Honorary Members		6	0
Members and Associates	8	18	0
Bursar, for use of Lantern, Gas, &c....		15	0
Sale of Report	9	0	0
Interest on Deposit	2	8	7
	£152	18	3

EXPENDITURE.

	£	s.	d.
Gas, Limes, &c. for Lectures... ...	2	0	5
Hire and Purchase of Slides	1	15	6
Lecturer's Fees and Expenses ...	5	7	0
Expenses of Conversazione	13	13	3
Stationery		8	4
Stamps	1	7	1
Carriage of Parcels		7	3
Hook, for reading Thermometers ...	2	0	0
Cutting grass round Meteorological Instruments		1	0
Prizes	2	0	0
Hunt, for printing Report	11	11	9
Balance in hand	112	6	8
	£152	18	3

Examined and found correct,

December 16th, 1907. S. A. SAUNDER. H. R. POLLOCK, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 9th.

H. Hill, Esq,, gave a "Chat about Spiders."

The lecturer said that most people regarded spiders as unpleasant, because they were ugly, and also cruel. But all spiders were not ugly, and it was noticeable that the ugliest were found near our houses. With regard to cruelty, they had to kill to eat no less than we, but no spider kills for pleasure. Spiders and the lace-wing fly and the ladybird do a garden no harm, but much good. The spider, however, is not an insect. An insect has its body in three parts, has its skin in segments, and breathes through two holes in its body. The spider, on the other hand, is divided into two parts and has four, not three, pairs of legs. It also breathes through two air chambers on its back. Its throat it uses for sucking only, and so need never stop to take breath. Another distinguishing feature in some species is a pair of feelers, in the male these are clubbed at the end. Their eyes are as a rule eight in number, arranged in different patterns according to the species. Among the night hunters the eyes are larger and are placed in front. However, no spider can see very far. Those living on webs can only see to the end of their legs, and others ten or twelve inches. The jaws of the spider are are also very interesting. They consist of two muscular appendages, called falces, opening outwards. At the bottom are poison fangs. When a fly is caught, it is transfixed by the fangs and pressed down on the jaws, which are fixed. Thus the spider can hold it under its tongue. Under the tongue is the throat, which is only a sucking tube; for the spider cannot eat anything. In the matter of communication it is very probable that they are like the cricket, and that the female spider has organs of hearing on the leg, since there she has a hair at right angles to the leg, communicating with a very important nerve. Spiders differ in their feet too. Some have two claws and a smaller one resembling a thumb, others two claws and a pad, this latter enabling them to climb smooth places. The lecturer then explained the very interesting way a spider makes its thread. It forces glue through a number of perforations in its feet; this hardens on contact with air; thus each thread is made up of numbers of

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exceedingly thin fibres. The web is commercially useless being too fine, but it is used in telescopes for fixing accurately the position of a point. Spiders can travel great distances borne by the wind, but they go so fast that it is impossible to see how they hold their feet. The lecturer pointed out that it was impossible for a spider to travel on the top of its thread. He showed his audience the way the spider built its web from the very beginning, and then some of the specially beautiful webs made by some young spiders; for when old the spider does not care about its web. They build at night to prevent the sun from drying up the glue they put on their threads to catch their prey. Spiders lay about 600 eggs in a beautiful silk woven ball. These eggs hatch out in April. Spiders when born do not undergo any change of form, but periodically change their skin. If before changing they have lost a limb, with the new skin they get a new one. He also said that anyone could keep spiders in a glass jar without their attempting to escape until the end of the summer, when they always disappear. Most spiders are born in the spring and die in the autumn, but the house spider lives four or even five years. Spiders make excellent mothers but, as the lecturer humorously remarked, shocking husbands. In fact the male spider has got so small in some cases as to be hardly noticeable beside the female. He showed the interesting way spiders live and rear their families underneath the water. Spiders, too, are imitative. In Brazil, for the purpose of self protection, one species makes itself so like the ants that they can hardly be distinguished. The lecturer concluded with a very interesting account of the trap door spiders and their ways. The whole of his lecture was profusely illustrated with beautiful photographs.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, February 23rd.

A. Smith Woodward, Esq., L.L.D., F.R.S., gave a lecture on "Hunting for Fossil Bones."

A vote of thanks to the lecturer was proposed by Mr. Blundell.

Saturday, March 9th.

The Rev. Canon W. W. Fowler, D.Sc., gave a lecture on "Ants, their Structure, Nests and Habits."

The senses of ants are highly developed and their mental powers differ from those of men not so much in kind as in

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degree. They have a highly developed sense of smell and are able to communicate with one another by something approaching to language. Their brains are very large in proportion to their size and they are supposed to be the most intelligent of all insects. They differ largely in their powers of attack and defence: some of them have stings, some have poison fangs, whilst the wood ant, found in pine woods, ejects formic acid which induces considerable smarting. Their nests are formed in a variety of situations and of many different materials. Some burrow underground throwing up mounds which contain a complex and orderly arrangement of galleries; in South America these ant-hills are sometimes several feet in height. The leaf cutting ants invade trees in enormous numbers each cutting out a circle with marvellous precision, sometimes stripping the trees bare: these pieces are carried off to their underground homes and utilised in forming the nests. Some however store the leaves until they decay and become covered with a fungus which forms the food of the ant. Some irritate the roots of a particular tree causing a growth to form like an oak gall in which the ants live. Others again build in trees, fastening the leaves together, whilst the "carpenters" hollow out their chambers in the trees themselves. Some, known as the "agricultural" ants store up millet seed and other grain. In Central America there is a very ferocious, carnivorous species known as the driver ant. When a horde of these approach a village the inhabitants flee and the ants invade the houses, filling them from top to bottom. They damage no furniture, but clear away beetles, bugs, rats, and even small snakes. In some nests a proportion of the ants are known as "honey" ants: these are nothing more than animated honey pots, having the power of receiving and retaining honey in the abdomen, which is about the size of a grape, this they exude from their mouths to feed other members of the community. Some species are very fond of the sweet, honey like secretion which flows from the plant-lice or Aphides, and even keep droves of these for no other purpose than to serve as cows, protecting them in sheds and caring for their eggs. Some ants carry off pupae from other nests and when developed these captives are converted into slaves who do all the work of the nest, not only working and foraging but in some cases even feeding their masters who become dependent for their lives on the slaves. Ants are very particular as to who are allowed to enter their nests and will kill any stranger who intrudes, but they always recognise their own tribe, even when these have been carried away as pupae; they however tolerate other associates besides the aphides mentioned before, and in particular a kind of woodlouse has been found which

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seems to act as a living dust bin. There are some species of spiders which imitate ants in self protection. The so called "white ants" are not really ants at all; true ants belong to the same family as the bees, whilst the white ants are related to the dragon flies. These white ants are very destructive to furniture, they eat into the inside of it, no external sign being visible until the whole is so honey combed that a touch will cause it to crumble to powder.

A vote of thanks to the lecturer was proposed by Mr. FitzGerald.

Saturday, March 23rd.

C. A. L. Irvine, Esq., K.O.S.B., gave a lecture on "Southern Nigeria."

The lecturer commenced with a description of the journey to Nigeria which occupies thirteeen weeks. Nigeria itself is a self supporting colony, paying its own officials. It possesses several important towns of which the chief is Kalaba, it is entirely surrounded by bush: a photograph was shewn of a gang of prisoners road-making near the town. The military operations in Nigeria are to a great extent controlled by the season. From October to January is the dry season during which almost the whole of the work has to be done. From January to October is the wet season during which little is possible, especially between January and March when hot dry winds blow across from the desert. The country is very liable to tornadoes which swoop down with scarcely any warning and carry away trees or sometimes whole villages. The military head quarters are at Araba, on a part of the coast very dangerous from its whirlpools. The country takes its name from the great river Niger, 2,600 miles in length and in the wet season navigable to a considerable distance by even large vessels. In dry weather only the smallest boats can pass the sand banks. It is inhabited by a number of tribes, each speaking its own language. The natives are very ignorant and often present a ridiculous appearance in various assortments of European clothes, as for instance a top hat, red tunic, and white cuffs with bare legs. In many ways they make good soldiers, and are excellent gunners, but they depend very largely on their officers; left to themselves their superstitious fear of evil spirits entirely destroys their courage. All transport has to be effected by carriers and the great number of these required by an expedition constitutes a serious difficulty, for they fly at the first shot. Until quite recently the natives had never seen a horse, and now a neigh is often

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worth a battalion of infantry. The native religion consists of the worship of ancestral spirits. Many of the native customs are degraded: cannibalism is common; twins are always killed and their mother driven out into the bush. The climate is very bad, malaria is rampant and very fatal; the only safeguard is in large doses of quinine.

A vote of thanks to the lecturer was proposed by Mr. Collett.

Saturday, May 18th.

V. S. Bryant, Esq., gave a lecture on "Egypt."

The lecturer commenced by saying that he had intended to give a lecture on the Great Pyramid, but had at the last moment been compelled to change the subject of the lecture since he had not been able to obtain sufficient slides. He then gave a description of Cairo, which, under the brilliant eastern sky, is a very imposing town of flat roofed houses with innumerable domes of mosques, having in all a circumference of seven miles. Amongst the many mosques, that of Mohamed Ali in the citadel is the finest having massive pillars inside, which are 40 feet in height and cut from one block of stone. The streets of Cairo are very narrow and dusty; in many places the second stories of houses overhang the road to such an extent that people can almost shake hands out of the windows. There are many market places in the town since each market place is kept for the sale of one special line of goods. There is one great draw-back to the town, and that is it has no water supply of its own, in consequence of this all the water has to be brought up from the Nile by water-carriers; this is very awkward when there is cholera in Upper Egypt and the river becomes infected, as many as 50,000 deaths have been recorded amongst the natives in the town in one year. The Arabs never omit to pray towards Mecca seven times a day for a quarter of an hour, no matter what they are doing at the time they will always stop and start their prayers. The lecturer went on to speak of the Great Pyramids which are ten miles out of Cairo and can be reached either by driving, which is very cheap since one is able to hire a two horse victoria for 1s. 2½d. an hour, or on a camel, which is a very useful animal in the deserts since it can go at about three miles an hour for a week without wanting water. The Great Pyramid which was completed in B.C. 2170 took 20 years to build: 400,000 men were employed in four detachments each of 100,000, working for three months in the year. It is built on a square flat rock 100 feet above the level of the desert. It covers an area of

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13 acres and is as high as the spire of Salisbury Cathedral plus the College spire. It is the most marvellous building in the world since all the rocks of granite, some of which weigh 13 tons, were brought 500 miles before they could be raised into place. It faces the astronomical, North, South, East, and West. Another curious fact is that the ratio of its height to twice the length of its base is that of the diameter of a circle to its circumference. The Pyramid used to be covered with polished marble, all of which has now been removed to build mosques and other buildings. The lecturer then showed a slide of the great Sphinx which is much older than the Great Pyramid, it stands 70 feet high and has a temple, cut out of the rock, inside. Sphinxes are generally put along the roadside leading to a temple, these have the head of a woman or an animal. At Karnac there is an avenue two miles long and 60 feet wide leading to a temple and every 12 feet there is a sphinx. The statues of Rehotep and his wife Nefert which are in the museum at Cairo, date back to B.C. 3122 and on them is some of the earliest writing that we have knowledge of The Colossi of Thebes are also very magnificent, measuring 18 feet 3 inches across the shoulders and 10 feet from the shoulder to the crown of the head, in all they are between 60 and 70 feet high and tradition relates that one of them weeps every night when the sun sets and rejoices when it rises in the morning. The lecturer then described a sandstorm, which he said rembled a London fog filled with sand at 120° F travelling at 80 miles an hour. Camels can tell when a sandstorm is coming, and bury their noses in the sand, whilst their riders lie flat on the ground until the storm has passed, this sometimes takes about a quarter of an hour and sometimes as much as from three to four hours.

Mr. Bryant before ending his lecture showed slides of Suez and Port Said both of which have grown important since the opening of the Canal in 1866.

A vote of thanks to the lecturer was proposed by Mr. Awdry.

Saturday, June 1st.

C. J. Sharp, Esq., gave a lecture on "Folk Song," with musical illustrations by Miss Kaye.

The lecturer commenced with some general words upon the nature of Folk Songs. It is generally supposed that the English peasantry, unlike that of any other European country, have no appreciation for music, which is quite an erroneous

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idea although held by many of the educated musicians of England. The reason of the growth of this idea is that Englishmen have never taken the trouble to listen to the songs and see the dances of their country-folk, and have judged from the stupid appearance of the rough yokel that he has no love of music. To show how entirely untrue this is, Mr. Sharp said that he had in three or four years collected nearly 1,500 tunes, almost all of which were from Somerset. Someone once expressed the wish that the English, instead of burning Guy Fawkes, would spend one day of the year in burning John Bull; for the picture of the Englishman in John Bull is not a correct one; he is represented as having no intellectual power and no love of romance, although the average Englishman possesses both to a large degree. During the medieval ages, England was the home of song, and it was said that, Hispani plangunt, Germani ululant, Galli cantant, Angli jubilant; so we were always spoken of as 'Merry England.' But now all is changed; there is no sadder place than the countryside of to-day, the village greens used to be filled with dancers and people singing good old country songs, which have now almost passed from their memories.

The lecturer next turned to the definition of a Folk Song, saying that there was an antithesis between Folk Music and Art Music; the latter is the result of direct inspiration and is the composition of one man, whereas Folk Music is the production of generations of singers. A song is handed down from father to son, and, never being committed to paper, becomes gradually changed to suit the requirements of its hearers. So it is that a Folk Song, though dating from a long time back, is always new, and always expresses the wishes of the people; indeed this is its vital characteristic. The chief peculiarity of English Folk Song is its variety, and the different emotions which are expressed; perhaps this is because the English are a very mixed race.

Miss Kaye, who was helping to illustrate Mr. Sharp's lecture with some actual Folk Songs, then sang a song, called 'The Seeds of Flowers' which is a great favourite and has a beautiful melody; this was the first song that Mr. Sharp had obtained, and it was sung by a gardener, who said that 'one might bide in a cradle and listen to it.' The next song illustrated another side of the English character, the love of romance. It was called 'Henry Martin'; and was sung by an old sailor at Bridgwater. Henry Martin was a pirate in the time of James I, and was very famous for the recklessness of his deeds. The song was remarkable for its force and power, and was warmly appreciated by the audience. The

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next was a rollicking love song with a delightful chorus of 'Fol de rol de diddle dum de day.' It was obtained from an old woman of over 70 practically on her death-bed, and was, so to speak, rescued from the grave.

After these three musical illustrations which were beautifully rendered by Miss Kaye, Mr. Sharp showed that the true English character was to be found by a study of the nation's Folk Songs. A rustic must not be judged by his conversation, for he has no command of language, and would give the impression that he was not intellectual. But his character may be judged from his songs, as they are the expression of his tastes and humours. The first thing noticeable is that ninety per cent. of his songs are love songs, which, though perfectly natural in an Italian, seems entirely out of keeping with the solid demeanour of an English rustic. Another remarkable fact is that, although a yokel will take a pride in staying in one parish all his life, he is very fond of a story of travel or of the 'rover.' Among the villagers too, there are some cynics, who are rather more clever than their fellows and keep themselves aloof. Mr. Sharp once asked one of these what he thought of a family called the Pilchers, who lived in the district. The man replied 'Pilchers, Sir! Well! what I thinks of Pilchers is that they're like women. When they're bad, they're terrible bad, and when they're good, they're middling.'

Miss Kaye then sang three more songs even more sentimental than the first three. The first of the group was a pastoral ditty; the second a song, traces of which may be found all over Europe, even in in Iceland. The name given to it was Lord Rendall; it was a plaintive melody telling of a deserted lover who has come home to die with a refrain of 'Make my bed soon, for I'm sick at my heart and I fain would lie down.' The third song was obtained from an old shepherd on Christmas-day, and was a version of 'Where are you going to my pretty maid?' Mr. Sharp said that they had sat on a gate while the shepherd was singing and the sheep came up to them and looked on in surprise.

After this, the lights were turned down and pictures of the real heroes and heroines of these Folk Songs were thrown upon the screen. They all ranged between the ages of 60 and 90, for their children scorn these songs and refuse to learn them, preferring the type of popular song of the present day. Among their number was an old woman who had contributed over one hundred songs to the lecturer, and he did not think her memory yet exhausted. Another old woman, when asked whether she had ever heard one of these songs sung by anyone, replied that the vicar's daughter had sung it last year,

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and she said 'She played her own zinging'; meaning that she accompanied herself on the piano and added 'that she thought that was rather a good idea, as when her voice faltered like, 'er put the pull on 'e and eazed 'erzelf!'

The lecture concluded with three more songs, the first a gipsy song, 'Lady Maisby,' telling of her flight with the 'rag-a-tail gipsies'; the second, the well-known song of 'Widdicombe Fair,' which exists in different forms all over England, and the last was an Oriental song called 'The Two Magicians,' contributed by an old blacksmith. The clever manner in which Miss Kaye sang all these songs was thoroughly appreciated by the audience.

Mr. FoxStrangways proposed a vote of thanks to Miss Kaye and Mr. Sharp for a most interesting and instructive evening.

Saturday, July 6th.

A Conversazione was held in the New Buildings.

The following is the list of the exhibits:

1. *C. J. Blomfield, Esq.*
   Architect's Working Drawings of the New Buildings.
2. *The Fine Arts Publishing Company.*
   Selection from the "Connoisseur" and "Burlington" Proofs.
3. *E. F. A. Hay, J. H. Hay, and W. E. Pain.*
   Natural History Photographs.
4. *The Rev. The Master.*
   Early Photographs of the College.
5. *Messrs. Chatto & Windus.*
   The "Medici" reproductions from Old Masters.
6. *The President of Common Room.*
   Perspective Drawing of the Original Design for the College.
7. *S. Begg, Esq.*
   Original Drawing for the picture of His Majesty presenting the Toye Trophy to the Combermere Dormitory.
8. *Miss Connell.*
   Demonstration of Printing in Colour from Mezzotint Plate.
9. *The Rev. H. P. FitzGerald.*
   Harmonograph.

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10. *Mr. H. Helm.*
    Demonstration of Scientific Glass Blowing.
11. *Miss Rawlings.*
    Demonstration of Embossed and Coloured Leather Work.
12. *E. M. Eustace, Esq.*
    Rupert's Drops.
    Bologna Vials.
    Regelation.
13. *H. R. Pollock and J. H. Hay.*
    Some Optical Illusions.
    Principle of Soaring of Birds.
    Paradromic Rings.
    Transparent Fused Silica.
    X Ray Photographs.
14. *G. le Q. Martel and R. A. Peters.*
    Pyrometer.
    Microphone.
15. *V. S. Bryant, Esq.*
    Calculating Machines.
16. *W. H. Kennett, Esq.*
    Wilberforce Spring.
    Sympathetic Pendulums.
    Other Resonance Experiments.
    Polariscope.
17. *R. Kerr, Esq., and C. A. Stocken, Esq.*
    Geometric Pen.
    Goold's Vortex Plate.
    Gyroscope.
    Water Hammer.
    Lace Bark.
    Owl Moth.
    Cut Stones.
    Illustrations of Protective Mimicry.
18. *G. E. Blundell, Esq.*
    Growth of Crystals.
    Polarised Light.
    X Rays.
19. *The Rev. T. Lemmey.*
    Vortex Rings.
20. *J. L. Bevir, Esq.*
    Dwarf Lemur (Madagascar).
    Meerkat (South Africa).

The New Kitchens were open for inspection and Demonstrations of the various Cooking Appliances were given during the evening.

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Saturday, July 20th.

J. H. Hay read his Essay on "Birds at a spot on the Welsh Coast," for which the Pender Prize had been awarded.

The part of Wales spoken of is composed partly of cliffs and partly of marshes, both of which have their different species of birds. Among those which frequent the cliffs, the peregrine falcon is the most striking species of the hawk tribe, and sometimes may be seen playfully swooping at a raven which has approached with mistaken zeal to defend its nest. The cry of the peregrine is a loud, sharp 'kek-kek-kek' repeated very fast. The sparrow-hawk and kestrel are both to be found, but while the former is most often seen in the low-lying lands, the kestrel breeds on the cliffs. Besides these three representatives of the hawk tribe, hobbies, buzzards, martins, and rarely the osprey are all said to be seen there, but this needs confirmation.

The raven is on the whole perhaps the most noticeable inhabitant of the cliffs and there were in 1906 as many as four and perhaps five nests. Ravens differ much individually in their behaviour, *e.g.* in care of their nests and young. One pair did not seem to be anxious even at the approach of men, while another bird showed such excessive zeal that he even descended to the chase of a wren. Wheatears, linnets and pipits were also objects of his attention, but especially the jackdaws, which nest on the cliffs round about. Some of the chases after these birds were very exciting and seemed certain to end in the capture of the intruder, but on account of his superior powers of flight the jackdaw always managed to escape. The jackdaws seemed to enjoy it and sometimes were clearly trying to annoy the ravens by a combined and noisy approach. Gulls are seldom attacked. The two notes most commonly used may be represented as 'gluck, gluck' in various tones, and a loud deep croak sounding like 'clouk, clouk.' The female is slightly smaller than the male, and her plumage is less glossy. A noticeable feature of their flight is the way in which they often turn right over on their backs, and then right themselves again, not seeming however to fall meanwhile. Gilbert White gives a very curious explanation, viz.: that 'they are scratching themselves with one foot and thus lose the centre of gravity.' Ravens are partial to eggs and occasionally carry off from a farm ducklings almost ready for the market. In 1906 by April 17th, nearly fledged young occupied three nests. In the fourth there were newly-hatched young and one egg, the lateness of this nest being probably accounted for by an accident.

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Of the other members of the crow family the jackdaw is by far the most numerous. These birds tumble towards the ground like plovers and also turn over in the air like ravens, but are not such adepts at it.

Magpies breed there, but not commonly, and the chough, of which no signs were seen in 1906, is said to have been breeding there in 1895.

Of the gulls to be seen on this coast quite 95 per cent. seemed to be herring gulls, most of which were in full adult plumage. They breed in great numbers on the cliffs in accessible positions. They have two distinct alarm notes, 'ke-ew, ke-ew,' and 'ow-ow-ow.' Another which seems to express curiosity is a rapid 'er-er-er.'

The lesser black-back gull no doubt breeds there, though not much in evidence, and the greater black-back is still less frequently met with, those seen in 1906 being in the immature plumage.

The razorbill is sometimes to be seen.

On April 26th, there were about 200 guillemots to be seen standing on the ledges or indulging in the curious habit they have of turning upside down in the water, thus showing the white under parts uppermost. While flying the legs are stretched out behind the very short tail, and the smallness and thinness of the wings remind one of those of a swift. By April 29th practically every bird had disappeared. On the 26th also two gannets were seen fishing some way out at sea.

Cormorants breed in fair numbers. The noise made when driving off a raven resembles the voice of a man talking some way along the cliffs. When carrying a fish, one half is held down the throat and the other hangs out of the beak. Six shags were seen one morning.

Of the smaller birds the most striking is the wheatear. These birds sing in the air and when on the ground behave very much like a thrush. They are extremely artful and careful not to give away their nests and often deceive the observer. Stone chats, which are very common resemble the wheatear greatly in this respect. The hen stonechat seems to do all the building, though the cock is the more excited of the two when the nest is approached.

The corn bunting quite warrants its other name of the common bunting and the song, heard the whole day on every side, soon becomes monotonous.

The stock dove is a fairly common breeder in the cliffs.

The waders are well represented. Curlew and whimbrel, the latter on migration, are often to be seen. The curlew's note is a melodious 'curlee,' while that of the whimbrel is a fast 'tetty-tetty-tetty.' Without this difference in note, it

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would often be almost impossible to distinguish the two species. Parties of oyster-catchers, in one case comprising as many as 18 birds are a fairly common sight. The common and purple sandpipers are also to be seen there, the latter haunting the foot of the cliffs. It is a very tame bird and allows a near approach.

Snipe breed abundantly on the marshes. Besides the bleating sound a rather fast 'grek, grek, grek' is used, but apparently only when descending in the air and very probably only in the breeding season. In one nest the young could be heard chirping inside the eggs, and were hatched the next day. When newly hatched their beaks are soft and flexible.

The ringed plover breeds on one of the marshes and half-a-dozen nests were found in quite a short distance. There are three distinct notes, 'tu-lee, tu-lee' and a more rapid alarm note 'tu-tu-tu.' When one is chasing another the note used is 'ke-oo-oo' rather fast. This last is also used by the members of a flock when flying away from an intruder, while the 'tu-lee' cry is only made by one bird, apparently the leader, which gives the signal for flight.

Sheldrake are fairly common, breeding in the rabbit-holes in the sandhills. They make a cackling noise rather like a goose and also a melodious whistle.

Lastly besides the meadow pipit there is the rock pipit, which has less white in its tail than the former, and is a fairly common breeder.

The President congratulated Hay on the excellent Essay which they had just heard; he hardly knew whether to admire most the very close observation he must have exercised to collect the facts or the extreme patience required to secure the beautiful photographs with which the Essay had been illustrated. He was glad to say that they would have a permanent memorial of the work of the two Hays and of Pain who had allowed the Society to have enlargements made from their photographs which would be exhibited in the new museum. It was no disparagement to say that another Essay, very nearly as good as the one they had just heard, had been sent in, and the judges had experienced considerable difficulty in deciding to which the prize should be awarded. He was sorry they had not been able to hear the other as well.

Saturday, October 12th.

Professor H. H. Turner, D.Sc., F.R.S., gave a lecture on "New work on the Sun."

The lecturer showed a large number of lantern slides

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illustrating some parts of the present knowledge of the Sun. One slide was a photograph of the Corona, or outer envelope of the Sun, which can only be seen at the moment when the Moon just covers completely the photosphere or ordinary surface of the Sun. The Corona was seen to be a mist all round the Sun, but with far-reaching rays which died away at their extremities so that it was impossible to say where they ended. It is not impossible that these rays emerge from great Sun-spots and that they extend as far as the Orbit of the Earth. If this is true it would show the way in which we on Earth may be affected by Sun-spots. Mr. Maunder has lately shown that there is some apparent connection between the magnetic storms which disturb our telegraphic instruments, and the presence of large spots on the Sun. His argument is based upon the observed fact that these storms often recur at intervals of twenty-seven or twenty-eight days which is just the time taken by the Sun to rotate once, and thus to present again to us the same spot. Another striking slide was a set of five photographs taken by M. Hansky of the surface of the Sun. The scale of the slide was so vast that the whole Sun would have been twenty yards across. It could be seen that the surface consisted of cloudlets that mottled the whole Sun, and on these great enlargements measures could be made of the size of these cloudlets and also of the distances through which they had moved in the few seconds between the two exposures. The cloudlets were about 500 to 1000 miles across, and were all moving about at paces which varied from ten to fifty miles a second. From these cloudlets was radiated out by far the largest part of the light and heat of the Sun.

A vote of thanks to the lecturer was proposed by J. A. Hardcastle, Esq.

Saturday, October 26th.

The Rev. H. P. FitzGerald gave a lecture on "The Fertilisation of Plants."

The first few slides helped to explain the organs possessed by a flower which are necessary for the fertilisation of the young ovules. The lecturer then explained that it was the object of the plant to receive pollen from the flowers of some neighbouring plant of its own kind, rather than to use its own pollen, as by this means a stronger and more fertile progeny was produced, and the rest of the lecture illustrated some of the methods and contrivances adopted by various flowering plants for the purpose of securing this. The agencies used

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for the transference of pollen from one plant to another may be roughly classed under the following headings—insects (chiefly bees, butterflies and moths), birds, and the wind. The colours, honey and scents of the plants are used to attract the insect visitors, while the lines on the petals, etc., serve as sign posts, directing them where to find the honey. Slides showing contrivances for keeping out undesirable visitors were also explained, and also some of the methods used by nature for protecting the various organs of the flower from rain. The case of the wind fertilised plants was illustrated by the Oak, Willows, Elm, and the Oat; colouration and scent being unneccessary here, the flowers are green, but very productive of pollen.

A vote of thanks to the lecturer was proposed by Mr. Brabant.

Saturday, November 16th.

O. A. Shrubsole, Esq., F.G.S., gave a lecture on "The History of a Common Pebble."

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, November 30th.

H. Awdry, Esq., gave a lecture on "A Cruise in the Mediterranean."

The lecturer began by showing a map of a tour he went at Easter, 1907, to Troy, the Dardanelles, Brusa, Constantinople, Mount Athos, Salonika, and other places.

He first showed slides of Stromboli telling the audience how he had been unlucky in missing an eruption by a single day; then the celebrated whirlpool of Charybdis, a Race like Portland Race only much milder, and the Rock of Scylla, a bold promontory with a town upon it and a cave in its face.

He then showed an excellent slide of three dolphins about 12 feet under water, taken by Mr. Blundell in the Bay of Biscay, and encouraged photographers to try and get such results themselves,—from his own experience a not impossible task with proper conditions. After telling some of the Greek mythological stories about dolphins, he pointed out that these beautiful poetical dreams were derived from the habit of the dolphin of going *in front* of the vessel as if to guide it.

Then after two views of Mount Cynthus in Delos and the Cave where Apollo and Diana were born, and a view of a man ploughing on the site of Troy, he came to Sestos and Abydos on the opposite sides of the Dardanelles, and told the stories of

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Hero and Leander, and of Xerxes' bridge, connected with that spot. After views of the final scene of the Peloponnesian War at Lampsacus and Ægospotami, he came to Brusa, a most glorious site in the arms of the Phrygian Mount Olympus, chosen by Hannibal for Prusias King of Bithynia, to be his Capital.

In medieval times it was celebrated as being the capital of the Othman Turks before they took Constantinople, and all the six or seven Sultans from Othman who took Brusa to Mahommed II who took Constantinople have Turbehs (burial chapels) there with their sarcophagi and turbans. The most handsome is the Turbeh of Mahommed I, called the Green Turbeh from the colour of its tiles.

Coming to Constantinople, he shewed views of Seraglio Point, Galata Tower, Galata Bridge and other sites, but especially of the wonderful Walls on the landward side, running 4½ miles from the Sea of Marmora to the Golden Horn, and which defended Constantinople for 1040 years from their commencement in 413 in the reign of Theodosius II, when the Huns were threatening Europe, to its capture by the Turks in 1453, the time of the Wars of The Roses.

Thence he passed on to Mount Athos, the Holy Mountain, to which no female even of animals is admitted, and where 3,000 monks and 4,000 attendants are living exactly the Monastic life of the Middle Ages. On this lovely peninsula 40 miles long and four broad, perched on precipices and the most inaccessible places, are twenty-one or more Monasteries of all sizes which are practically fortresses too. There are many Sketes also, small congregations with a church between them; and there are over 900 churches in all. There also one meets with medieval hospitality, and payment for food was impossible.

He also showed the general plan of a Byzantine Church such as all on Mount Athos are, with examples of its details.

Lastly, he went from the sanctity of Athos to the brigandage of Salonika, where brigand chiefs are strutting about the city known to everybody. He showed examples of the plan of a Roman Basilica, so many of which were from the suitableness of raised platform and apse at the end for the tribunal, open space in the centre, and colonnades at the sides, transformed into churches with chancel, nave and aisles; and he showed a view of the fine church of San Demetriou there. Then after a view of the Gate at either end of the great Roman Via Egnatia, the high road from Rome to the East, which ran through Thessalonica, he ended with a beautiful slide showing "Sunset at Salonika."

A vote of thanks to the lecturer was proposed by The Master.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Saturday, February 2nd.

At a Committee Meeting, H. E. Craddock, H. R. Pollock were elected Members.

Saturday, February 9th.

At a P.B.M. the following were elected Associates: H. C. Read, C. W. R. Tuke, B. H. Bonham Carter, A. C. Sykes, Hon. A. P. Methuen, B. E. Nicolls, L. Lacey Smith, H. M. Heyland, L. G. Murray, E. J. Howard, T. G. P. Roupell, D. Y. Hay, G. H. Wyndham, P. R. Hughes, G. C. Bampfield, F. G. Cavendish, J. A. Childe Freeman, H. E. Biggs, L. I. C. Paul, T. E. B. Beatty, J. C. Tyler, D. L. Pogson, G. A. P. Scoones, W. H. M. Kersey, J. H. Nelson, R. A. Grey Wilson, R. St. L. Portal, J. R. Wilton, E. A. Spencer, R. V. Burke, M.A. S. Riach, M. F. Heath, V. W. K. Mackinnon, F. R. A. Somerset, E. E. Leacock, V. C. Brown, S. L. Mac Watt, J. K. Maitland, R. S. Riach, R. A. G. Stewart, E. E. MacMahon.

Wednesday, May 15th.

At a P.B.M. the following were elected Associates: R. G. W. H. Stone, W. H. R. Hinde, L. Jones Bateman, J. A. Jervois, R. N. O'Connor, I. B. M. Hamilton, Y. E. Guinness, R. M. F. Townsend, K. F. P. Mackenzie, J. W. Battersby, J. H. Stafford, J. C. W. Francis, W. A. Lowy, H. H. Nash, J. L. Beddington, H. W. N. Lawrence, S. P. Whitfield, W. F. V. M. Milner, D. F. de Wend, R. A. H. Lewin, R. H. Broome, C. E. S. Beatson, J. P. Duke, M. L. Loveless, L. E. Poynder, C. M. Beazley, S. W. Thompson, Hon. R. H. B. Norton, C. G. Parker, A. J. C. Pollock, P. R. Hardinge, R. P. Needham, G. A. K. Lawrence, B. K. Young, H. F. C. Skinner, E. Lathom, K. F. W. Dunn, A. J. S. Hammans, R. E. Kane, J. M. Gordon, D. A. Campbell, E. G. Earle, O. S. Cumming, C. C. Mitchell, G. H. Kernaghan, J. H. Turner, P. E. Johnson, R. M. Slater, A. E. Clark Kennedy, O. A. Knapton, T. P. Pilcher, T. N. C. Garfit, T. A. R. Barnes, J. D. P. Chataway, C. R. H. Stirling, F. A. H. Mathew,

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E. W. Maude, E. H. Allen, G. E. Gunning, G. A. M. Paxton, R. B. Stanley, G. R. Bolitho, E. F. O. Richards, R. F. Cooper, D. Hamilton Field, Hon. R. Westenra, E. S. Buckley, H. W. St. George, Sir T. R. Berney, E. R. M. L. Liston.

H. V. White, R. L. Atkinson were elected Judges for the Pender Prize.

At a Committee Meeting, G. le Q. Martel, J. E. Shearer, F. A. Phillips were elected Members.

Thursday, October 10th.

At a P.B.M. the following were elected Associates: B. C. Newton, L. Errington, R. G. Fenwick, A. W. Turner, B. E. Nicolls, G. W. T. Lindsay, R. Elsdale, A. E. Collier, C. W. Hooper, J. O. Tomlin, F. M. Dimond, W. E. Houston Boswall, G. J. T. H. Villiers, E. R. Gould, C. J. Coker, C. A. M. Alexander, G. O. Simson, E. S. M. Prinsep, C. J. E. Greenwood, C. M. Methven, P. R. Hughes, E. T. Fletcher, W. H. M. Kersey, R. H. Coles, L. A. W. B. Lachlan, G. F. Griffith, W. M. Cliff, C. W. E. Craddock Hartopp, H. A. Tyler, R. G. W. Rimington, P. L. Barrow, R. D. O'Connor, M. S. Close, D. L. Pogson, H. S. Allfrey, T. E. B. Beatty, E. W. Goodman, A. W. I. Thomson, E. G. Bartlett, L. H. H. Harris, C. A. Lucas, G. N. Pyke, J. H. Courage, H. H. R. Hilliard, B. C. H. Davies Cooke, C. C. Burdon, E. J. Bannatyne, S. St. B. Collins, A. C. Arnold, G. F. Welch, H. G. D. Clutterbuck, D. V. O'M. Creagh, G. C. H. Crawshay, W. H. C. Edwardss, J. C. Hallowes, W. G. Hewitt, E. G. Sullivan, J. N. Milton, R. S. Riach, E. M. Miles, J. F. Glass, R. C. Guthrie Smith, J. F. B. Ewen, W. R. Davies, H. E. Hebbert, H. Longbottom, J. Hanbury Williams, E. W. M. Burrows, A. F. B. Howard, J. K. Maitland, G. B. Loyd, D. A. L. Ainslie, D. H. Gordon, E. D. Marrable, C. B. Wainwright, D. M. Sealy, G. W. E. Hanmer, V. H. Barnard, E. E. MacMahon, L. C. Breitmeyer, P. W. Dane, Hon. H. W. C. Denison, J. G. Hutt, R. O. S. Johnstone, C. G. Mathew, B. G. White, J. A. D. Skinner, G. M. Gordon, F. E. D. Campbell, M. A. S. Riach, G. S. Dyer, L. L. Forwood.

Votes of thanks were passed to L. Lawrence Smith and R. A. Peters for their services as Secretary and Treasurer respectively.

B. C. Newton was elected Secretary.

H. R. Pollock was elected Treasurer.

At a Committee Meeting, B. C. Newton, A. F. S. Napier were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time, until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their nnmber.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus, chosen by the winner, subject to the approval of the President.

The winner may, if he choses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President and obtain his sanction, before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some

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branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1907 was awarded to J. H. Hay for an Essay on "Birds at a spot on the Welsh Coast," of which an abstract is given on pp. 23–25.

A second prize was awarded to L. Lawrence Smith for an Essay on "Crows and Rooks."

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the Society, for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). More credit will be given for collections illustrating the life history of particular species, *e.g.*, larva in different stages, pupa and imago, than for collections showing only the final stage of development, *e.g.*, butterflies and moths. Each collection must be accompanied by a note-book giving dates and localities for all the specimens, and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

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III. One or more prizes are offered by the N.S.S. to Members and Associates for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1907, the prize in Group I was awarded to G. C. H. Crawshay.

In Group II the first prize was awarded to L. Lawrence Smith, the second prize to G. C. H. Crawshay.

In Group III the first prize was awarded to J. H. Hay, the second prize to C. G. Y. Skipwith; A. E. Clark Kennedy was commended.

Photographic Prizes.

Mr. Blundell offered a prize, value £1, to Members of the Photographic Section, for the best photographs of Natural History subjects. This was awarded to J. E. Shearer.

Mr. Longland offered a prize for the best photographs of Birds' Nests, Eggs and Young Birds. This was awarded to A. F. S. Napier; A. E. Clark Kennedy and H. E. Biggs were highly commended.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·61	50·4	35·2	42·5	42·1	97	10	·36	S.
2	·21	42·9	41·4	41·7	39·9	86	10	·07	S.W.
3	29·35	42·4	34·3	39·1	37·1	83	0		S.W.
4	30·19	45·4	32·3	37·9	35·8	82	0		S.W.
5	·33	48·7	29·3	45·1	44·1	92	10		S.
6	·33	47·3	40·0	41·2	39·6	87	5		W.
7	·52	45·4	29·9	34·2	32·3	81	10		S.W.
8	·51	45·2	33·4	43·3	41·7	87	10		N.W.
9	·36	45·3	40·8	42·1	40·1	84	10		W.
10	·30	47·7	41·2	43·1	42·1	92	10	·21	S.W.
11	·53	44·1	36·7	37·3	36·3	91	0		N.
12	·57	48·2	29·6	39·9	38·3	87	10		S.W.
13	·52	48·9	39·3	43·3	42·6	95	10	·01	N.W.
14	·41	45·6	42·9	43·2	41·1	84	10		W.
15	·50	44·5	42·3	42·7	40·9	86	10		W.
16	·56	45·1	41·7	43·1	41·2	86	10		S.W.
17	·47	45·1	39·8	41·1	38·9	83	10		S.E.
18	·38	40·1	20·5	22·5	22·5	100	10		E.
19	·58	36·3	21·9	35·5	33·8	85	10		S.E.
20	·59	38·1	27·6	33·7	32·3	85	10		S.E.
21	·53	45·9	33·3	37·9	37·0	93	10		S.E.
22	·33	39·4	29·9	35·5	35·1	96	10		W.
23	·72	36·6	23·3	24·3	23·5	78	10		N.E.
24	·43	35·9	20·7	22·9	22·5	88	7		N.E.
25	·38	32·1	21·7	26·7	26·1	85	10		E.
26	·40	33·7	20·0	30·4	30·1	95	10		N.E.
27	·33	40·9	18·8	30·9	30·4	92	0	·02	N.E.
28	30·02	49·3	30·3	39·7	38·1	87	8		S.E.
29	29.65	43·9	35·8	41·1	40·7	97	0		W.
30	29·76	41·4	31·9	40·2	39·9	98	5		W.
31	30·04	38·1	28·6	34·1	33·6	94	0		N.E.
								Total	
Mean	30·27	43·0	32·1	37·3	36·1	89	7·6	·67	
Mean for 25 years	29·98	43·5	32·5	37·9	36·9	90	8·2	1·99	

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FEBRUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·32	38·9	25·5	34·1	33·3	87	0		N.E.
2	·47	36·1	16·6	27·9	27·6	94	8		N.E.
3	·28	32·7	15·6	27·6	27·0	88	10		N.
4	·17	35·1	23·3	28·4	27·8	88	10	·04	S.E.
5	·27	36·4	27·9	34·9	34·3	93	10	trace	N.E.
6	30·22	39·2	31·5	36·1	35·8	97	2		E.
7	29·83	38·1	22·5	34·1	33·8	96	4		N.E.
8	·94	42·1	29·4	35·1	34·6	95	10	·10	N.E.
9	·75	43·7	29·4	39·7	39·1	95	10		N.E.
10	·79	46·1	27·6	33·5	31·5	80	5	·36	S.E.
11	·58	43·9	32·5	37·7	37·1	94	2	·15	N.W.
12	·01	46·9	29·6	41·7	41·7	100	10	·32	N.W.
13	29·46	41·9	34·1	37·1	34·5	78	10		N.W.
14	30·18	44·5	30·5	38·1	35·6	79	3	·02	N.
15	·05	50·4	35·3	44·1	43·7	97	10	·03	S.
16	·07	50·2	39·4	44·9	41·7	77	0	trace	S.W.
17	·04	49·9	37·8	47·6	45·3	83	10		W.
18	30·04	50·1	39·5	45·5	44·4	92	10	·02	S.W.
19	29·80	49·9	38·2	45·9	42·7	77	10	·36	S.W.
20	·08	42·4	33·8	38·9	34·8	68	6	·10	S.W.
21	·53	38·7	30·4	31·7	30·8	88	6	·02	N.E.
22	·75	38·1	29·6	35·7	32·0	69	10		N.E.
23	29·92	38·7	15·8	31·7	28·3	61	0		N.E.
24	30·17	44·9	17·9	28·9	28·0	82	0		N.W.
25	·25	47·3	27·9	44·7	43·5	70	10		N.W.
26	·36	45·4	39·7	41·1	41·1	100	10		N W.
27	·46	49·1	37·7	45·1	44·9	99	10		N.E.
28	30·62	54·1	25·4	40·2	40·1	99	10		N.E.
								Total	
Mean	29·96	43·4	29·4	37·6	36·3	90	7·0	1·52	
Mean for 25 years	29·98	45·3	32·4	45·2	37·1	88	7·7	1·74	

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MARCH.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·42	52·8	29·5	39·9	39·9	100	10		N.E.
2	·30	52·3	29·8	43·7	40·9	79	10	·05	S.
3	·30	50·9	29·3	37·1	36·9	98	10		W.
4	·30	50·9	33·3	38·7	37·7	91	10		S.W.
5	·18	47·9	26·6	32·1	31·6	92	10	·02	S.W.
6	·14	49·1	28·3	42·9	39·7	76	0	trace	S.W.
7	·25	57·4	29·3	41·9	41·2	95	10	·04	S.W.
8	·05	49·1	40·2	41·9	41·7	98	8		S.W.
9	30·23	53·4	36·5	43·1	39.7	76	10	·19	S.
10	29·35	56·2	41·5	53·1	50·3	81	5	·05	W.
11	30·19	47·1	35·8	36·2	35·2	91	10		E.
12	·41	46·1	19·5	40·1	33·0	52	3	·19	S.E.
13	·04	51·1	38·5	45·9	41·2	68	8	·07	S.W.
14	30·08	49·1	34·3	43·9	38·1	61	6	·03	N.E.
15	29·93	53·7	38·2	48·7	48·0	95	10	·08	S.E.
16	·81	48·9	46·4	47·1	46·1	92	10	·12	S.W.
17	·58	54·1	38·7	45·7	42·1	74	8	trace	W.
18	29·66	56·7	42·5	54·2	47·7	62	7		W.
19	30·05	53·1	36·3	48·4	48·3	99	8	·01	N.W.
20	30·18	54·1	46·0	50·7	46·2	71	8		N.W.
21	29·48	58·1	26·6	52·1	49·3	81	0		N.W.
22	30·36	57·8	34·5	51·9	51·8	99	5		N.W.
23	·38	53·7	30·3	48·1	47·5	95	0		N.E.
24	·35	56·1	26·3	35·9	34·1	85	10		S.E.
25	·37	59·0	27·9	44·2	41·9	83	10		N.W.
26	·44	63·0	31·1	56·1	55·0	93	6		N.
27	·46	64·8	28·4	56·9	56·8	99	0		N.E.
28	·33	67·3	26·5	55·7	55·2	97	0		N.E.
29	30·10	65·1	29·1	50·4	48·6	88	0		S.E.
30	29·99	68·1	32·7	61·4	58·1	81	4		S.
31	29·96	68·9	34·3	51·9	51·7	99	0		N.
								Total	
Mean	30·12	55·4	33·2	46·4	44·3	85	6·3	·85	
Mean for 25 years	29·89	49·7	33·5	42.1	40·0	84	7·3	1·79	

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APRIL.

Date.	Barom. reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·90	69·1	31·9	59·7	55·8	77	0		N.W.
2	·55	64·8	35·3	61·2	55·5	69	2	·13	N.W.
3	·20	51.9	44·2	48·9	48·9	100	10		N.W.
4	·35	53·2	35·5	48·2	45·1	79	6		N.W.
5	·61	59·0	29·5	51·5	50·8	95	4	·06	N.W.
6	·40	55·4	43·4	50·2	48·0	85	8	·44	N.W.
7	·31	52·1	34·3	50·3	39·9	43	10	·41	N.W.
8	·44	54·7	37·2	58·6	57·7	94	8	·10	W.
9	·53	52·1	39·7	47·1	46·5	95	10	·05	W.
10	·79	50·9	32·3	43·1	42·7	97	10		E.
11	·75	49·9	36·5	41·7	40·9	94	10	·05	N.E.
12	·63	53·9	39·4	46·1	44·1	85	10	·50	N.E.
13	·48	56·1	43·2	52·9	47·2	65	8		S.
14	·63	56·2	38·0	44·8	42·6	83	10		N.W.
15	·61	52·7	38·2	44·2	41·5	80	10		N.E.
16	·51	52·9	38·5	41·9	40·9	92	10		N.E.
17	·64	55·5	38·7	44·4	41·7	80	7	·10	N.
18	29·99	47·1	28·6	41·7	36·0	61	2		N.
19	30·05	51·6	28·9	42·1	38·5	73	10		S.W.
20	30·15	58·8	30·5	48·3	43·2	67	2	·13	W.
21	29·92	53·2	42·2	48·7	48·2	95	10	·22	S.
22	30·27	59·1	36·3	52·9	47·2	65	6		S.W.
23	·41	62·3	41·2	53·4	50·2	79	10		W.
24	·32	71·1	50·2	62·2	57·7	75	10		W.
25	·22	61·8	45·2	61·7	56·3	70	8	·53	W.
26	30·02	45·4	40·0	41·1	41·1	100	10	·27	N.
27	29·83	50·9	31·3	46·2	41·2	66	8		N.
28	·88	51·7	30·7	44·7	39·7	65	8	·07	N.
29	·76	56·7	40·7	50·7	46·4	61	10	.03	N.W.
30	29·66	54·2	35·6	52·2	48·2	74	10	·25	W.
								Total	
Mean	29·76	55·5	37·2	49·4	46·1	78	7·9	3·34	
Mean for 25 years	29·88	55·8	36·8	48·1	44·6	78	7·1	1·49	

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MAY.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·81	53·4	36·5	44·9	40·9	72	10	·15	N.W.
2	·41	54·2	40·2	51·9	47·5	72	10	·07	W.
3	·48	54·9	41·4	48·4	46·9	88	10	·03	W.
4	·64	58·0	41·4	52·7	45·7	59	8		S.
5	·80	64·0	34·9	48·4	45·6	80	10		E.
6	·66	72·9	46·2	64·2	57·4	64	2		E.
7	·69	61·8	47·5	54·2	50·8	78	10	·10	W.
8	·88	61·8	42·4	58·7	53·6	71	10	·05	S.
9	·88	63·8	44·2	53·7	50·5	79	10		S.
10	·80	71·1	50·0	63·3	55·8	56	10		S.
11	·80	74·4	48·3	68·1	59·4	57	10	·47	S.
12	·78	77·9	51·0	69·1	62·5	66	0	·06	S.
13	·91	63·8	50·3	52·1	51·0	93	10	·02	N.W.
14	·84	59·0	50·2	52·2	50·2	86	10		N.W.
15	·84	61·8	40·4	58·5	52·5	66	10		N.E.
16	29·96	58·0	45·1	52·1	47·2	69	10		N.W.
17	30·17	54·9	41·4	52·2	45·1	59	10		N.
18	·19	52·4	31·5	49·4	44·1	66	10		N.
19	·12	52·7	28·8	45·9	41·2	68	10		N.
20	30·00	50·1	38·0	45·2	41·1	72	10		N.E.
21	29·80	51·1	38·2	47·7	43·4	72	10	·06	N.E.
22	·74	59·3	40·5	49·5	46·2	78	10	·07	S.
23	·67	64·8	49·1	59·1	57·1	88	10	·02	S.
24	29·72	64·8	45·2	60·1	58·4	89	10		S.
25	30·03	69·7	47·9	64.4	56·8	60	3	·31	N.E.
26	29·98	61·3	51·3	53·5	53·2	97	10		N.E.
27	30·09	69·9	52·2	61·2	57·7	80	10		N.W.
28	·09	56·4	46·2	55·4	54·1	91	10		N.
29	·13	56·8	42·4	51·3	45·7	65	10		E.
30	30·13	58·1	41·7	51·9	48·2	76	10	·11	S.E.
31	29·74	63·1	51·2	57·1	56·4	95	10	·07	S.
								Total	
Mean	29·86	61·2	43·7	54·7	50·5	75	9·1	1·59	
Mean for 25 years	29·96	60·2	42·4	54·3	49·9	74	6·9	1·76	

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JUNE.

Date.	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	°/₀	0—10	In.	
1	29·49	62·2	52·0	60·2	57·1	82	10	·62	S.W.
2	·63	58·3	51·3	55·4	53·0	84	10		W.
3	29·77	57·8	42·9	50·2	44·7	65	10		W.
4	30·07	59·8	42·2	57·7	51·2	64	10	.03	W.
5	29·73	64·8	51·8	55·7	53·9	89	10	·53	S.W.
6	·73	67·1	49·0	56·7	51·8	70	10	·06	W.
7	·91	65·6	43·2	59·9	57·1	83	10		S.W.
8	·94	68·7	52·2	63·3	56·9	66	8		S.
9	·78	72·9	47·1	68·9	62·5	76	0	·03	S.E.
10	·76	64·8	52·5	61·4	56·8	74	5	·05	S.W.
11	·91	65·6	48·6	61·4	54·5	63	8	·25	S.W.
12	·68	64·1	52·0	61·3	56·9	75	8	·06	S.
13	29·89	67·1	51·0	59·7	57·1	84	8	·03	S.W.
14	30·11	64·8	48·1	57·4	55·2	86	10	·05	S.W.
15	29·98	57·1	55·0	56·7	56·0	95	10	·12	S.W.
16	30·12	63·0	44·7	55·7	48·2	58	3		W.
17	30·19	67·1	39·2	58·1	51·5	63	6		W.
18	29·37	60·8	45·2	58·4	52·2	65	10		S.W.
19	30·05	65·0	44·4	58·7	53·2	69	10		S.W.
20	29·93	67·1	48·1	58·7	55·2	79	10		S.W.
21	·86	63·6	47·1	60·2	51·6	55	6	·02	W.
22	·92	64·5	50·2	60·1	54·3	67	8	·02	W.
23	·92	63·6	48·4	56·4	50·2	74	5	·19	N.
24	·90	60·6	46·9	55·1	53·0	86	10	·10	S.W.
25	·80	58·3	47·1	57·1	51·8	69	10	·10	W.
26	·83	67·9	52·0	58·1	54·2	77	10	·02	S.
27	·93	66·9	54·2	59·4	57·4	88	10	·10	S.W.
28	·98	64·0	49·6	58·1	52·5	68	10		W.
29	·98	66·3	39·5	60·5	53·4	62	10	·23	W.
30	29·86	56·9	42·2	51·5	51·0	97	10	·25	E.
								Total	
Mean	29·87	63·9	49·3	58·4	53·8	72	8·5	2·86	
Mean for 25 years	30·05	67·9	47·5	60·1	55·5	75	7·1	2·10	

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JULY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·91	60·3	46·2	56·4	50·3	65	10		N.
2	30·08	61·1	44·2	56·2	51·2	70	10	·04	W.
3	29·80	59·0	43·2	52·7	50·8	88	10	.16	S.
4	·63	64·0	48·1	57·7	53·8	77	10		S.W.
5	·79	64·0	47·1	62·2	55·5	64	8		S.
6	·99	64·5	46·1	60·1	52·6	60	10	·01	S.
7	·99	63·3	46·9	55·5	51·8	77	10		S.W.
8	·89	61·1	44·6	57·7	52·6	71	8	·05	S.W.
9	29·95	64·1	51·8	59·1	54·8	75	10	·05	S.
10	30·14	60·3	46·3	48·4	46·9	88	10	·10	N.
11	·46	65·8	37·3	59·4	53·2	65	5		S.W.
12	·40	68·7	41·2	63·3	63·1	99	6		W.
13	·27	72·1	42·5	63·9	60·4	80	5		W.
14	·27	69·2	54·7	59·7	57·2	85	10		N.
15	·38	76·2	56·0	69·1	59·9	56	0		N.E.
16	·40	74·1	53·0	65·5	59·7	69	0		N.E.
17	·30	69·9	50·0	59·9	55·5	74	10		N.
18	·17	75·1	49·3	61·9	57·2	74	4		N.
19	·17	76·9	48·1	69·9	63·1	65	3		S.E.
20	·17	78·2	51·0	70·2	62·7	63	0		S.E.
21	·14	69·3	51·5	58·3	56·2	87	10	·31	E.
22	30·00	70·1	54·8	61·3	60·2	94	10	·25	N.W.
23	29·91	65·0	51·0	52·9	52·8	99	10		E.
24	·97	67·4	52·0	63·1	57·5	69	5		E.
25	·97	64·1	44·5	61·1	55·8	66	10	·10	N.E.
26	·97	71·1	54·0	62·2	59·4	83	8	·10	S.W.
27	29·94	71·9	58·3	65·1	60·1	73	8		S.W.
28	30·06	68·9	58·7	61·4	59·1	87	10		S.W.
29	29·97	71·9	55·2	68·3	59·9	58	6	·12	W.
30	29·77	67·1	54·2	62·1	57·9	76	10	·22	W.
31	30·00	64·8	46·1	57·9	51·8	66	10		W.
								Total	
Mean	30·03	67·7	49·3	60·7	56·2	75	7·6	1·51	
Mean for 25 years	29·99	70·9	51·4	63·3	58·8	76	7·0	2·03	

AUGUST.

Date.	Barom. Reduced	Thermometers. Max.	Min	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In	°	°	°	°	°/o	0—10	In.	
1	30·04	67·1	42·4	62·7	54·5	57	5		N.W
2	30·14	71·9	44·0	61·7	57·5	76	5	·30	S.W.
3	29·95	73·1	53·0	62·7	61·9	95	10		W.
4	·94	73·3	60·9	66·9	63·5	81	10		S.W.
5	·90	70·7	45·4	62·7	58·7	77	5	·04	S.W.
6	29·86	67·7	51·7	62·6	55·3	62	5	·10	S.W.
7	30·09	66·3	48·3	65·7	56·4	55	7		W.
8	30·09	61·0	52·3	60·3	58·7	90	10		S.W.
9	29·98	69·3	58·1	62·4	57·3	72	10	.04	S.W.
10	29·78	69·7	55·0	61·5	59·2	86	5		W.
11	30·03	69·1	50·3	60·3	56·6	79	2		S.W.
12	·30	68·3	51·8	63·1	57·6	70	10		S.W.
13	·15	68·4	53·0	65·2	60·9	76	10	·03	S.W.
14	30·04	70·1	57·4	62·1	59·9	86	10	·48	S.W.
15	29·70	67·7	51·8	61·3	57·4	77	5	·21	W.
16	·95	62·8	50·2	57·4	52·3	71	3	·03	N.W.
17	·90	70·1	53·8	62·7	56·7	67	7	·70	W.
18	·87	68·1	56·5	63·7	63·1	96	10		W.
19	29·91	65·0	51·0	57·9	55·0	83	10	·12	W.
20	30·03	60·8	45·2	54·4	51·3	79	6	·04	N.W.
21	·33	64·3	41·2	60·7	54·8	66	10		W.
22	·36	65·6	49·1	58·7	55·0	77	10	·08	W.
23	·03	63·3	53·0	59·2	56·5	83	10		W.
24	·03	63·8	40·0	56·2	52·8	79	10		N.
25	·03	71·8	41·0	60·4	57·7	83	5		N.W.
26	·03	65·3	41·2	61·9	59·9	88	10	·27	S.W.
27	·10	69·9	47·6	63·7	56·8	63	10		W.
28	30·06	73·9	42·4	66·1	59·1	64	0		S.W.
29	29·99	74·1	44·4	67·9	60·4	62	2		S.
30	29·64	70·9	44·5	62·2	58·7	79	10		S.
31	30·03	70·4	56·8	65·1	60·7	76	3		S.
								Total	
Mean	30·01	67·9	49·5	61·9	57·6	76	7·3	2·44	
Mean for 25 years	29·96	70·1	50·7	62·2	58·2	77	6·9	2·16	

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SEPTEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·10	59·5	44·4	53·5	49·4	74	2	·01	N.E.
2	29·75	60·0	47·4	59·4	55·2	75	10	·14	S.W.
3	·73	58·3	45·2	53·7	49·6	74	8	·31	W.
4	·93	62·4	43·7	51·5	49·3	85	10	·16	N.
5	·89	67·3	48·9	61·9	59·3	84	10	·03	W.
6	30·07	70·9	58·1	63·1	62·1	94	10	·02	S.W.
7	·27	67·3	59·9	63·3	61·9	91	10		S.
8	·41	72·4	52·6	60·7	60·4	98	10		S.
9	·45	71·2	49·0	59·9	57·6	85	10		E.
10	·34	71·9	40·4	57·3	52·3	71	8		S.E.
11	·24	70·8	35·8	53·9	53·6	98	0		S.E.
12	·19	75·4	41·2	56·9	56·2	95	8		S.
13	·11	76·1	43·7	64·9	60·7	76	7		S.E.
14	·16	65·2	51·8	59·8	54·8	82	6		E.
15	·34	66·5	36·8	55·5	51·5	75	6		E.
16	·41	69·5	40·2	63·5	57·7	68	5		W.
17	·36	68·0	49·9	62·7	57·3	70	7		S.E.
18	·72	66·4	44·2	60·3	55·4	71	2		S.W.
19	72	70·9	37·5	60·9	56·4	73	0		S.W.
20	·72	69·9	42·2	54·1	53·8	98	0		S.W.
21	·35	63·6	51·0	53·5	52·8	95	10		S.W.
22	·62	62·3	52·2	55·4	51·0	73	7		S.W.
23	30·30	63.6	30·4	56·9	51·0	65	4		W.
24	29·81	70·1	29·8	58·9	55·0	76	2		W.
25	·76	78·9	39·0	68·9	62·5	67	5	·05	N.
26	·67	71·9	56·5	64·4	60·1	75	8		S.
27	·84	72·1	56·2	64·4	60·9	79	10		S.E.
28	·83	71·9	56·0	66·7	61·7	73	10		E.
29	·84	60·8	54·2	54·5	53·8	96	10	·01	E.
30	29·78	65·1	54·0	56·2	56·0	99	10		E.
								Total	
Mean	30·16	68·0	46·4	59·2	56·0	81	6·8	·73	
Mean for 25 years	30·04	65·6	47·4	58·2	55·1	82	7·0	1·80	

OCTOBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·59	64·8	65·4	64·9	59·4	69	5	·23	S.E.
2	·59	62·6	65·1	57·9	51·3	63	8	·08	S.W.
3	·54	73·4	62·9	56·9	52·2	71	6		S.
4	29·86	60·0	73·6	55·1	51·8	79	6		N.
5	30·07	61·3	60·3	57·4	53·2	75	0	·10	W.
6	29·83	62·1	61·6	59·2	58·9	98	10	·14	W.
7	·58	56·8	62·4	52·1	51·0	92	10	·04	N.W.
8	·48	55·4	57·1	44·1	43·7	97	10	·15	N.E.
9	·59	57·8	55·5	52·9	52·8	99	10	·05	N.E.
10	·63	59·8	58·1	57·7	53·0	72	8	·32	S.
11	29·89	61·0	60·1	59·4	55·2	75	5		S.
12	30.07	62·6	61·3	59·9	54·5	69	8		S.W.
13	29·78	62·3	62·9	50·7	50·4	98	10	·02	S.
14	·42	57·8	62·6	54·1	52·8	90	10	1·20	S.W.
15	29·29	55·5	58·1	50·1	46·4	74	8	·03	S.W.
16	30·30	52·1	55·6	48·1	47·8	98	10	·40	E.
17	29·13	52·5	52·2	48·9	47·8	91	10	·13	E.
18	·32	57·8	42·2	52·1	49·6	82	10	·57	S.W.
19	·59	61·0	49·6	56·9	54·2	82	6	·23	S.
20	·54	57·6	48·4	54·5	53·0	89	10	·26	S.E.
21	·91	62·6	45·8	54·2	53·2	93	5		S.W.
22	·99	59·1	46·6	54·2	50·8	78	8	·12	W.
23	·91	54·3	41·4	48·4	48·2	97	10	·04	S.
24	·82	54·1	35·3	54·2	47·8	62	2		S.E.
25	·81	54·2	31·6	46·1	45·7	97	10	·15	S.
26	·75	48·7	31·5	45·2	45·1	99	10		N.
27	·82	47·6	41·2	43·9	43·7	98	10		W.
28	·58	55·9	37·2	47·1	46·1	92	10	·05	S.E.
29	·30	52·9	46·1	49·1	49·0	99	10	·65	E.
30	·14	54·5	49·1	51·7	51·3	97	10	·06	S.E.
31	29·71	58·3	40·4	54·4	51·3	79	0		S.E.
								Total	
Mean	30·06	57·9	52·3	52·9	50·7	86	7·9	5·02	
Mean for 25 years	29·92	56·4	41·6	49·9	47·9	87	7·4	2·98	

NOVEMBER.

Date.	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	29·92	52·9	30·3	45·7	40·7	66	10		S.E.
2	·69	56·6	40·2	52·7	50·8	87	10		S.E.
3	·56	55·9	45·7	48·1	47·0	91	10	·01	E.
4	29·90	52·1	37·6	45·2	45·2	100	10		N.
5	30·04	54·1	45·2	50·7	49·3	90	10		N.
6	·16	52·1	40·2	48·4	47·5	93	10		S.W.
7	30·06	49·9	43·5	48·4	46·7	87	8		N.E.
8	29·79	57·0	43·4	47·1	47·0	99	10		E.
9	29·79	60·8	45·5	56·9	54·3	83	6	·01	S.W.
10	30·00	53·4	41·6	46·1	46·1	100	10		N.
11	29·41	48·1	31·8	36·2	36·1	99	10		N.W.
12	·81	51·1	31·6	46·1	45·7	97	10	·11	S.E.
13	29·81	52·9	40·4	50·1	44·9	66	2		W.
14	30·01	53·7	36·8	51·1	50·5	96	10		S.
15	.22	49·1	44·2	45·9	42·7	77	10		N.W.
16	·25	48·9	25·9	36·1	32·6	70	4		S.
17	·17	51·4	35·6	48·9	47·2	87	10	·22	S.W.
18	·22	49·1	46·1	47·1	46·7	97	10	·23	S.W.
19	·25	48·1	41·4	44·7	44·4	97	10		E.
20	·20	43·9	34·5	41·2	41·1	99	10		N.
21	·32	42·9	35·6	40·4	40·1	97	10		S.E.
22	30·23	45·9	29·5	39·4	39·4	100	10	·21	S.
23	29·68	48·1	39·2	44·2	43·2	92	3	·03	W.
24	·77	46·5	31·0	36·1	34·6	86	0	·18	S.W.
25	·47	44·9	35·6	36·7	31·0	54	10	·41	N.
26	·20	55·1	29·4	44·4	44·4	100	10	·43	S.E.
27	·35	51·4	43·4	44·7	44·7	100	10	·26	S.W.
28	29·71	51·1	41·4	49·4	48·8	96	10	·02	S.W.
29	30·12	43·9	30·2	32·1	32·0	99	10		S.W.
30	30·38	43·7	29·6	37·1	33·4	70	10		S.W.
								Total	
Mean	29·92	50·4	37·5	44·7	43·3	89	8·1	2·12	
Mean for 25 years	29·94	49·6	37·2	43·7	42·6	92	8·1	2·52	

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DECEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·12	44·5	36·7	40·2	37·9	82	10		E.
2	29·87	51·2	33·8	41·1	40·6	96	10	.20	S.
3	·41	44·9	40·7	42·1	40·9	90	10		S.
4	·41	50·9	32·3	44·4	43·1	89	10	·29	S.W.
5	·20	46·2	38·7	42·5	41·7	94	8		S.W.
6	·61	44·9	28·6	39·4	37·9	88	0	·16	S.W.
7	·68	54·3	32·5	42·2	41·5	95	6	·36	W.
8	·20	56·7	38·9	54·2	53·8	97	10	·09	S.W.
9	·46	51·1	43·6	45·9	43·1	79	5	·28	S.W.
10	·41	50·1	40·5	45·7	42·1	74	2		S.
11	·53	46·9	40·0	43·5	41·4	84	5	·47	S.
12	·35	45·1	36·5	43·1	42·9	97	10	·50	S.
13	·43	49·3	33·8	40·2	38·9	89	5	·46	S.W.
14	·89	44·7	37·2	43·3	38·9	70	5	·03	W.
15	29·84	42·1	30·0	30·9	30·0	86	1		N.W.
16	30·19	47·2	28·9	38·5	37·9	94	10		S.E.
17	·28	46·9	33·5	41·5	40·1	88	5		S.E.
18	30·10	53·1	34·3	46·5	46·1	95	10	·05	S.E.
19	29·97	53·2	46·1	51·9	50·2	88	10	·01	S.
20	·91	53·5	47·3	52·1	51·8	98	8	·03	S.
21	·73	52·1	47·6	49·2	49·0	99	10	·04	S.W.
22	29·94	52·7	48·4	46·4	45·6	94	10	·28	S.W.
23	30·12	48·3	45·9	47·1	47·0	99	10	·03	W.
24	·28	44·4	36·8	39·2	39·2	100	10		E.
25	30·11	43·1	39·4	41·6	40·9	94	10		E.
26	29·95	39·7	31·8	33·3	32·6	92	10		E.
27	·67	44·7	30·3	31·9	31·2	90	10		E.
28	·56	34·1	31·3	33·7	31·8	80	10		N.E.
29	·85	33·9	31·8	32·6	31·2	82	10		N.E.
30	·93	34·2	31·0	32·1	32·0	99	10	·01	N.E.
31	29·84	34·7	31·1	33·7	33·6	99	10		N.E.
								Total	
Mean	29·77	46·4	36·8	41·8	40·4	90	8·1	3·29	
Mean for 25 years	29·96	44·2	33·2	38·8	37·8	91	8·2	2·34	

Total rainfall for the year, 25·97 in.

Mean for 25 years, 25·04 in.

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BOTANICAL REPORT.

An Incomplete List of Fungi found near Wellington College.

A short List of Fungi was published in the Report for 1901, these are included in the present one, which will serve as a guide for future reference.

Rhizina inflata.
Schleroderma verrucosum.
„ vulgaris.
Rhizopogon luteolum.
Auricularia mesenterica.
Sparassis crispa.
Clavaria dissipabilis.
Calocera viscosa.
Thelephora laciniata.
Stereum hirsutum.
„ purpureum.
„ rugosum.
„ sanguinolentum.
Hydnum repandum.
Dædalea quercina.
Polystictus abietinus.
Fomes annosus.
Polyporus amorphus.
„ versicolor.
Boletus badius.
„ edulis.
„ flavus.
„ elegans.
„ scaber.
„ variegatus.
„ chrysenteron.
„ piperatus.
Phlegmaceum scaurus.
Coprinus micaceus.
„ niveus.
„ plicatilis.

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Psilocybe semilanceata.
„ spadicea.
Hypholoma fasciculare.
„ capnoides.
„ epixanthum.
Stropharia æruginosa.
„ Percevali.
„ semi globata.
Agaricus campestris.
Paxillus involutus.
„ atrotomentosus.
„ panuoides.
Cortinarius (Dermocybe) caninus.
„ (Telamonia) hemitrichus.
„ „ bivelus.
„ „ torvus.
„ (Hydrocybe) decipiens.
Hebeloma mesophæum.
„ glutinosum.
Clitopilus prunulus.
Nolanea pascua.
Entoloma jubatum.
„ sericeum.
„ sericellum.
Cantharellus aurantiacus.
„ cibarius.
Hygrophorus virgineus.
„ niveus.
„ russo coriaceus.
„ miniatus.
„ coccineus.
„ pratensis, *var* minus
„ lætus.
Clitocybe clavipes.
„ candicans.
„ metachroa.
Laccaria laccata.
Lactarius torminosus.
„ pubescens.
„ blennius.
„ turpis.
„ vietus.
„ pallidus.
„ rufus.
„ subdulcis.
„ cimicarius.
„ glyciosmus.
„ deliciosus.

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Russula Queletii.
„ drimeia.
„ fragilis.
„ „ *var* violacea.
„ „ *var* nivea
„ furcata.
„ „ *var* ochroviridis.
Mycena sanguinolenta.
„ ammoniaca.
„ epiterygia.
„ vulgaris.
„ galopoda.
Collybia maculata.
„ semitalis.
„ butyracea.
„ dryophila.
Tricholoma resplendens.
„ sordidum.
„ album.
„ nudum.
„ flavobrunneum
„ rutilans.
„ terreum.
„ saponaceum.
Armillaria bulbigera.
Amanita muscaria.
„ rubescens.
„ mappa.
Amanitopsis vaginata.
Gomphidius viscidus.
Flammula sapinea.
Galera tenera.
„ hypnorum.
Tubaria furfuracea.

H. PUREFOY FITZGERALD.

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PHOTOGRAPHIC SECTION.

1907.

BALANCE SHEET.

RECEIPTS.

	£	s.	d.
Balance	14	7	3
Lent Term—Entrance Fees		7	0
Subscriptions		17	0
Easter Term—Entrance Fees ...	1	10	0
Subscriptions	2	6	0
Michaelmas Term—Entrance Fee ...		1	0
Subscriptions		15	0
	£20	3	3

EXPENDITURE.

	£	s.	d.
Lent Term—Knight, Hypo		3	6
Glass for Key		5	0
Sweeping		7	6
Easter Term—Knight, Hypo		10	6
Ifould, Repairs, etc. ...		5	0
Glass for Key		5	0
Sweeping		7	6
Lamp for Enlarger ...		1	0
Michaelmas Term—Knight, Hypo ...		2	9
Ifould, for work		10	0
Ruby Lamps, Batten ...		15	6
Staley & Co. for Screens		7	9
Houghton & Co. for Dishes	1	1	9
Lamp			6
Balance in hand	15	0	0
	£20	3	3

G. E. BLUNDELL.

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REPORT OF PHOTOGRAPHIC SECTION.

The clearing of the buildings, which included the Dark Room, has led to our being re-established in new quarters, In spite of enlargement and improvements the accommodation of the old room was never sufficient in summer, while the fact that it was so in winter may have had some connection with its being as cold and as damp as a cellar. Both in size and character the present Dark Room is considerably in advance of its predecessor—the double doors form a light lock, and thus enable anyone to enter or leave at all times without altercation ; with electric lights, safe, and sufficient illumination is easy, while the heating arrangements should promote the comfort of users, and prevent papers and plates suffering from damp in the lockers which are now both larger and more numerous.

An Enlarging Room has been separated from the other part to avoid interference with those developing.

The Section has every reason to congratulate itself on being provided with quarters both comfortable and well adapted for their purpose.

G. E. Blundell.

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THIRTY-NINTH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1908.

HEROUM FILII

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."

Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1909.

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'Επιστολὴ πρὸς 'Ρωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1909.

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THE WELLINGTON COLLEGE PRESS:
PRINTED BY THOMAS HUNT.

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Contents.

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RULES.

—:o:—

1. That this Society be called the "WELLINGTON COLLEGE NATURAL SCIENCE SOCIETY."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen, and the number of Associates to Seventy.

3. That all Members of the School be eligible as Associates and that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee and elected by the Members: their names with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings; a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members; and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other benefactors.

18. That Members and Associates pay a subscription of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all meetings of the Society; may read papers, with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That meetings be ordinarily held once a fortnight, but that the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

OFFICERS.

PRESIDENT—S. A. SAUNDER, ESQ.

VICE-PRESIDENTS { J. L. BEVIR, ESQ., H. W. OWEN HAGREEN, ESQ.
G. E. BLUNDELL, ESQ.

SECRETARY { B. C. NEWTON
G. O. DE R. CHANNER
P. GAISFORD

TREASURER { H. R. POLLOCK
A. C. SYKES

DIRECTOR OF THE PHOTOGRAPHIC SECTION—G. E. BLUNDELL, ESQ.

DIRECTOR OF THE ARTS SECTION—H. W. OWEN HAGREEN, ESQ.

CORRESPONDING MEMBERS.

THE DEAN OF LINCOLN
PROF. T. RUPERT JONES,
B. E. HAMMOND, ESQ. [F.R.S.
H. W. EVE, ESQ.
REV. W. MOYLE
F. E. KITCHENER, ESQ.
PROF. C. J. LAMBERT, F.R.A.S.
E. H. C. SMITH, ESQ.
LIEUT.-COL. W. C. POLLARD, B.S.C.
REV. G. C. ALLEN, D.D.
S. BALL, ESQ.
E. W. WILLETT, ESQ., M.D.
REV. W. D. FANSHAWE
C. R. HAINES, ESQ.
J. B. ATLAY, ESQ.
REV. H. I. LONGDEN
CAPT. H. G. LYONS, R.E., D.Sc., F.R.S., F.G.S.
R. R. OTTLEY, ESQ.
H. M. ELDER, ESQ.
REV. A. C. DEANE
H. W. MONCKTON, ESQ., F.L.S., F.G.S.
D. NICOLSON, ESQ., M.D., C.B.

HONORARY MEMBERS.

REV. THE MASTER
REV. A. CARR [F.R.A.S.
REV. P. H. KEMPTHORNE,
REV. E. DAVENPORT
F. W. CAULFEILD, ESQ.
W. J. TOYE, ESQ.
REV. A. IRVING, D.Sc.
S. A. SAUNDER, ESQ., F.R.A.S.
REV. W. GOODCHILD
E. K. PURNELL, ESQ. F.R.Hist.S.
T. A. ROGERS, ESQ.
H. C. STEEL, ESQ.
J. L. BEVIR, ESQ.
REV. A. E. ALLCOCK
E. A. UPCOTT, ESQ.
H. AWDRY, ESQ.
REV. H. WOOD
J. Y. PEARSON, ESQ.
W. H. RUSTON, ESQ.
R. MOORE, ESQ.
E. F. ELTON, ESQ., F.R.G.S.
REV. C. R. CARTER [ESQ.
A. H. FOX-STRANGWAYS,
H. G. ARMSTRONG, ESQ.
M. S. FORSTER, ESQ.
P. CHRISTOPHERSON, ESQ.
REV. J. S. TUCKER
W. D. EGGAR, ESQ.
REV. C. T. LAVIE
H. W. OWEN HAGREEN, ESQ.
O. T. PERKINS, ESQ.
J. W. CAVE ESQ.
A. E. BROOMFIELD, ESQ.
REV. H. P. FITZGERALD, F.L.S.
REV. W. F. BROWN
REV. T. LEMMEY
W. G. COLLETT, ESQ.
G. E. BLUNDELL, ESQ., [F.G.S
C. WELLS, ESQ.
W. D. G. NASH, ESQ.
REV. E. A. DOWNES
REV. W. H. WRIGHT
W. H. KENNETT, ESQ.
E. M. EUSTACE, ESQ.
C. A. STOCKEN, ESQ.
H. S. BRABANT, ESQ.

MEMBERS.

Those Members and Associates whose names are marked *p* are members also of the Photographic Section.

L. D. G. ALEXANDER†
F. G. G. WILLOUGHBY†
p H. E. F. CRADDOCK†
p H. R. POLLOCK†
p J. E. SHEARER
p F. A. PHILLIPPS
p C. G. Y. SKIPWITH†
p A. F. S. NAPIER
B. C. NEWTON*
A. C. SYKES
p A. E. CLARK KENNEDY
G. O. de R. CHANNER†
p R. A. V. FFRENCH
R. ELSDALE
p H. R. LUPTON
P. GAISFORD

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ASSOCIATES.

p F. C. HOPE
N. I. MacWATT
p E. M. L. AINSLIE
H. H. TRAVERS
J. A. CHILDE FREEMAN
D. W. BARING*
R. J. STEWART
p L. A. BARRETT
E. W. T. AGAR
p L. G. MURRAY
E. J. HOWARD
p D. Y. HAY
V. C. BROWN
S. L. MacWATT
W. H. R. HINDE
I. B. M. HAMILTON†
p A. J. C. POLLOCK
O. A. KNAPTON
T. A. R. BARNES
C. R. H. STIRLING
F. A. H. MATHEW
p E. W. MAUDE
p R. F. COOPER†
E. S. BUCKLEY
C. L. HERBERT†
G. T. H. VILLIERS
p C. J. COKER
E. S. M. PRINSEP
W. H. M. KERSEY
p R. H. COLES
M. S. CLOSE*
L. H. H. HARRIS
C. A. LUCAS
S. St. B. COLLINS
A. C. ARNOLD
E. M. MILES
p J. F. B. EWEN†
H. LONGBOTTOM
p E. W. M. BURROWS
A. F. B. HOWARD
D. A. L. AINSLIE
E. E. MacMAHON†
R. O. S. JOHNSTONE
C. G. MATHEW‡
B. G. WHITE
p J. L. C. MERCER
F. B. GEIDT
D. F. de WEND‡
p H. E. BIGGS
F. E. C. HILL
W. M. V. EDINGER
W. W. NEVILLE

R. F. NEWDIGATE
A. C. PARKER†
p H. ROSE*
F. H. DAVIDSON*
V. M. GRANTHAM*
L. O. JOHNSON
R. E. FRYER
H. L. HARVEY
H. S. CALVERLEY
L. S. LEE
p W. H. CROOME
F. M. CARVER
p H. W. N. LAWRENCE
p F. B. B. SPRAGGE
p L. E. POYNDER‡
p O. S. CUMMING
M. S. HARVEY JONES
p J. H. TRISTRAM
P. M. BROADMEAD
G. St. P. LAWRENCE
p F. S. W. RAIKES
p A. C. O'CONNOR
J. M. MILTON
W. D. M. STEWART
p D. J. STEEVENS
J. C. TYLER
G. F. WELCH†
G. C. H. CRAWSHAY
p E. H. BARKER
I. K. MATHESON
G. M. CHURCHER
A. L. BAYLY
H. R. O. DRAKE
J. L. BOWEN
N. B. DAVIS
p G. N. PYKE
p Sir T. R. BERNEY
E. W. GEIDT
B. E. NICOLLS
W. A. LOWY
p M. W. HUISH
W. F. V. M. MILNER
p J. H. NELSON
R. M. SLATER
H. C. S. MINCHIN
S. R. HURST
F. A. SYKES
G. S. DYER
G. S. W. SPENCER SMITH
R. I. COWAN
Hon. R. A. GROSVENOR

D. P. JEWITT
G. WALMSLEY
F. A. SOMERSET
p F. E. D. CAMPBELL
p H. V. SPANKIE
R. St. J. BLACKER DOUGLASS
p B. C. H. D. POOLE
T. B. TOD
A. W. G. WINDHAM
p E. H. BARKER
C. S. TUELY
p R. LANGEBRINK
A. W. C. CONNAL
p L. L. S. CLARK
J. R. CARTER
R. A. MAYBERY
R. H. C. THOMAS
R. LITTLEDALE
R. G. PINNOCK
A. H. SMITH
R. A. JENNINGS BRAMLEY
R. Ll. BROWN
J. CHALLINOR
J. W. DAVIDSON
R. L. B. GREY EGERTON
p A. G. LANGEBRINK
A. LEES
N. P. MANFIELD
J. L. MAXWELL
D. W. M. PRINSEP
A. C. SCOTT
B. H. L. GREEN
L. L. FORWOOD
R. W. PATTESON
T. O. L. WILKINSON
B. SIMPSON
F. A. V. COPLAND GRIFFITHS
R. EUSTACE
G. I. WIEHE
HON. R. WESTENRA
C. V. J. BORTON
H. C. Des VŒUX
C. B. G. FIELD
W. J. O. HARTOCH
R. A. D. McCULLOCH
C. W. MURRAY MENZIES
E. M. WEST

* Left Lent Term 1908. † Left Easter Term, 1908. ‡ Left Christmas Term. 1908.

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List of the Societies and Journals to whom Copies of the Report are sent.

—:o:—

*Ashmolean N.H.S.
*Cheltenham College N.H.S.
Christ's Hospital N.H.S.
Clifton College N.H.S.
*Dulwich College N.H.S.
*East Kent N.H.S.
*Epsom College N.H.S.
*Felsted School N.H.S.
*Haileybury College N.H.S.
*Harrow School Scientific Society.
King Edward's School, Birmingham, N.H.S.
*Malvern College N.H.S.
*Marlborough College N.H.S.
*Rugby School N.H.S.
*Uppingham School N.S.S.
Winchester College N.H.S.
British Museum (Natural History).
Geological Survey Office.
Linnean Society.
Royal Meteorological Society.
*U.S. Geological Survey Office.
*Chicago Academy of Sciences.
*El Instituo Geologico de Mexico.
*Cuerpo de Ingenieros de Minas del Perú.
*University of Montana.
*Wisconin Academy of Sciences, Arts and Letters.
Nature.

* Those marked with an asterisk exchange reports with us.

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ACCOUNTS.

RECEIPTS.

	£	s.	d.
Balance in hand	112	6	8
Subscriptions:—			
Lent Term—Honorary Members ...	1	14	6
Members and Associates	8	4	0
Easter Term—Honorary Members		3	0
Members and Associates	8	16	0
Michaelmas Term—Honorary Members		3	0
Members and Associates	7	6	0
Bursar for use of Lantern, Gas, &c. ...	1	10	0
Sale of Report	12	15	0
Interest on Deposit	2	10	0
Sale of old Cabinets, &c.	1	15	0
College Shop for Museum	150	0	0
	£307	3	2

EXPENDITURE.

	£	s.	d.
Gas, Limes, &c., for Lectures... ...	2	18	1
Lecturers' Expenses and Purchase of Slides	1	5	0
Stamps	1	8	5
Carriage of Parcels		14	5
Hook, for reading Thermometers ...	2	0	0
Cutting grass round Meteorological Instruments		1	0
Prizes	2	0	0
Hunt, for printing Report	14	15	3
„ „ „ Notices, &c. ...	1	5	6
Museum...	257	10	10
Balance in hand	23	4	8
	£307	3	2

Examined and found correct,

December 21st. 1908. S. A. SAUNDER.

A. C. SYKES, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 8th.

A. Petrocokino, Esq., F.R.G.S., gave a lecture on the "All red route from Quebec to Sydney."

The lecturer began by giving a brief outline of the lecture. He said that he would only devote twenty-five minutes to a description of Canada, in this however he proposed to show some twenty-five slides, and that he would then pass on to the less beaten tracks amidst the islands of Fiji and Samoa. The first few slides depicted the towns and agricultural areas of Canada, although such historic and interesting spots as the Heights of Abraham, a lasting tribute to Britain's military glory, the Government buildings at Ottawa, and the Falls of Niagara, were not omitted. While thus describing the towns of Canada, he gave a brief description of their inhabitants and their neighbours "over the red-line," touching especially on the ideas entertained by these latter on Sport, which do not strike the despised "Britisher" as particular fair. The prevailing instinct is to "do for the other man," whether by fair means or foul. The lecturer now travelled on "out West," that mysterious land of boyish imagination. Here, among the rugged mountains which seem to pierce the clouds, is the country of the fisherman and hunter. And hither flies the invalid, to regain lost health in the bracing, pine-scented air of Banff, and other spots where enterprising hotel-keepers are now raising their palaces. Through this paradise the lecturer passed on to Vancouver, where his twenty-five minutes expired. Before passing on to his next halt in Fiji, he told an amusing anecdote related to him by the two victims of the tale, which served to point out some of the peculiar relations between longitude and time. Two clergymen were rival preachers in an island on the opposite side of longitude 180°, and it was their custom to have a race to the island for the honour of preaching. During the early days of their ministry they forgot that, in crossing this line from East to West, a day was lost, and so, arriving in the morning primed for action, they discovered to their chagrin that it was Monday, and fled incontinently. The Fiji islands are among the most beautiful in the world. The capital, on

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Viti Levu has many fine buildings, and the islands carry on a brisk trade in Copra, sugar and tropical fruits. The islanders however are a lazy race, and Indians have to be transported from the main land, to meet the demands of trade. From these fairy isles he passed on to equally lovely Samoa. Here Mr. Petrocokino showed several most interesting slides, depicting types of the inhabitants of the islands, and then passed on to Australia. He stopped on the way to visit the hot-lakes and geysers of New Zealand, and the beauties of the New Zealand Lake District, and, after pausing to inspect the thriving commercial town of Auckland, passed on to Sydney. Here the lecturer concluded his address with several photographs of the neighbouring scenery, especially a most charming view of Sydney Harbour at night, in which the effect of the brilliant moonlight playing on the water was most striking.

A vote of thanks to the lecturer was proposed by Mr. Bevir.

Saturday, February 22nd.

Hastings Lees, Esq., gave a lecture on behalf of the Royal Society for the Protection of Birds.

The lecturer said that it was his duty to explain his presence there that night. To do this he must go some way back. A few years ago, the Society which he represented, had decided to offer a reward in each county to the School producing the best essay on trees and birds, and besides this a shield to be competed for in the same way by the different counties. In consequence of the success of this scheme, they had decided to offer a reward, to be competed for in the same way by the Public Schools, and it was to further this cause that Mr. Lee was now lecturing all over England.

The lecturer then passed on to a consideration of his subject. He said that the bird-tribe is one of the most important families in the world. In fact, the despised "dicky-bird" is the great link between the reptile and the mammal. In his person he unites the qualities of each. Mr. Lees pointed out that even in this sphere our "insular prejudices" cut us off from our neighbours, for, whereas the old Greek philosophers were ardent bird-lovers, no one followed in their footsteps in England till the 18th. century produced Gilbert White. From this time the study of birds quickly gained ground, until, at last, an enquiry to test the number of strictly English species elicited that there was but one, and that was Scotch, being the Scotch Grouse. It is ascertained, however, that there are about 220 species which visit these shores. All birds,

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are divided into two categories—Land or Water—these are in turn divided up again; the Land birds into Prey-catchers and Perching birds, and the Sea-birds into Waders and Swimmers.

Working in the order in which he had given the different tribes, Mr. Lees began by showing two beautiful eagles of the Golden and White-tailed species. From these he passed on to the Kestrel family, which, contrary to general opinion, is docile in captivity; and from these to the Owl tribe, those mysterious ghosts of childhood. The lecturer now approached the end of the Prey-catchers, with the cruel Butcher-bird, who is the link between the Perchers and their fiercer cousins. From these he proceeded to the second group of Perchers. First of these, Mr. Lees showed the thrush, together with its curious, mud-lined nest, to "keep out the draught." The Warblers were next dealt with. Of these the lecturer gave many specimens, the Olive, Garden, etc., and especially of their chief, the Nightingale. Great efforts are being made to stop the caging of this unhappy bird, which at one time looked as if on the high-road to extinction. After these, he passed on to the Finches. The rarest of this tribe is the Goldfinch, a bird which is, unhappily becoming very scarce, through the efforts of dealers. Mr. Lees also showed slides of the Chaffinch, with its exquisite little nest, so artfully concealed, and which is made entirely by the bird's own beak and claws. Next came that great family, the Tits. These are distinguished by the number of their claws, and their having muscles, unlike many other birds. This family is divided into five groups, the members of which are very gregarious. Mr. Lees then passed on to the Wagtail, with its perky air, which all know well. This bird is a most audacious little intruder, a pair were found nesting in a railway carriage in Southsea. The lecturer now described a few isolated birds, as the Lark, Nuthatch, and Yellow Hammer, and then went on to the Water-birds. He first produced a link with the Land-birds, namely the Dipper. This bird frequents shallow rivers, and is very cheerful. Being now pressed for time, the lecturer hurried on apace. The "Waders," as the next group were called, were not web-footed, and had long legs. The king of these birds is the Heron, which nests in the tops of trees. After touching on some of the greater "wading" families, Mr. Lees passed on to the swimmers. These were chiefly Ducks, and ended with the Great Auk, the last of which was eaten fifty years ago.

Mr. Lees brought his lecture to a close, by saying that, as a boy, he had laid bare the mysteries of bird-life with the barbarous "catapult," but was now content with the more

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harmless camera, and that he hoped that Wellington would make a good bid for the gold medal, if the scheme of the Bird Protection Society succeeded.

A vote of thanks to the lecturer was proposed by Mr. Bevir.

Saturday, March 7th.

C. R. N. Blakiston, Esq., gave a lecture on Ba'albek and Ephesus.

The former is a rather inaccessible spot a few miles from the coast of Turkey-in-Asia, reached by means of Bierût, a modern seaport. The latter is about thirty miles south of Smyrna, about six miles from the sea-coast.

Taking the train from Smyrna, the lecturer alighted at Ayassaluk, the terminus, from whence a good view of Ephesus can be obtained. The first thing which catches the eye is the ancient Roman Aqueduct, which used to bring water to Ephesus from the Hills. The pillars are about 30 feet high, and the remains of an arch can be found here and there. Between the terminus and the ancient city stands the hill of Ayassaluk, notable for the very fine old Roman Castle which stands on its summit, and for a magnificent Monastery situated half-way up the slope. Around the foot of this hill considerable interest has arisen, because there is known to be somewhere there the ruined foundations of the great Temple of Diana. In Ephesus itself are many great structures. The once famous city was built at the foot of a low range of hills. This enabled the huge Stadium to be made. This vast place of amusement was founded on, or rather in, the hill-side. The great semi-circle of stone benches, one above the other, was capable of holding some 24,000 people. The games were carried on in an arena. Another great ruin is that of the Gymnasium. This place was not meant only for Physical Culture, but acted as a place of meeting, public speaking, and a school; it also contained a library and probably baths. It is generally thought that this was the "School of one Tyrannus," referred to in the Bible. Ephesus became an important seaport through the efforts of Crœsus (560 B.C.). But the river Cayster flowing through the city, conveyed so much mud and earth down to the shore, that it very soon formed a large delta, which threatened to push Ephesus away from the sea. In spite of the Ephesians' efforts to avoid this by building dykes and the like, the river increased its delta to such an extent that the citizens gave up all hope and decamped elsewhere, for Ephesus as an inland town would be of no great value.

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The lecturer then passed on to Ba'albek, by way of Bierût, into hilly country. There are three great temples there which are dedicated to All Gods of Ba'albek, to Bacchus and to Venus. The first is famous for six huge columns—all that remains of it. These columns are about 70 feet high, and are examples of a very fine piece of architecture. The slabs of stone joining these great pillars at the top, were sculptured with lions' faces, the top of which reached a height of about 90 feet. The Temple of Bacchus is noted for the remarkable sculpturing on the roof, and pillars, some of which still stand. Last, and perhaps least, comes the Temple of Venus, quite a dwarf in comparison with the others, but, nevertheless, a very fine piece of work. Besides these are three great stones, called the Trilithon. They are enormous blocks some 65 feet long and 13 feet square. How they were placed in position nobody quite knows, for they must each have weighed about 1000 tons. They are placed on brickwork about twenty-six feet from the ground and are still intact, despite the fact that no cement of any kind was used.

A vote of thanks to the lecturer was proposed by Mr. Saunder.

Saturday, March 21st.

C. A. L. Irvine, Esq., K.O.S.B., gave a lecture on "the War in South Africa."

The lecturer commenced by stating the manifold difficulties of his subject. He would not be able to go into details of the war, during the all-too-brief sixty minutes given him, and so would give the main incidents, with a few of his own experiences. South Africa was divided into three sections, the plateau of Cape Colony, the two Boer states, Orange River Colony and the Transvaal, and the great Kalahari Desert. All this area was chiefly karoo, that is dry steppe, dotted with shrubs and low vegetation. The chief mountains were the mighty Drakensberg. Here is a panorama of the wildest scenery. Lovely gorges, down which rush mountain torrents, dense woods, rugged crags combine to enhance the beauty of these Titanic specimens of Nature's handiwork. Over these mountains, as Mr. Irvine pointed out, led the way to Ladysmith, and no better tribute stands to Sir Redvers Buller's indomitable spirit, than the way he led his army over them. The lecturer now passed to the Boer States where most of the fighting was destined to take place. These were wide, rolling plains, interspersed with low hills, locally known

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as "kopjes"; here the summers were wet, the warmest time being in the English winter. These plains were sparsely populated, and, owing to the lack of roads, very hard to traverse. Mr. Irvine then showed on the screen various specimens of the local mode of conveyance, the ox-waggon, and its driver, the indefatigable Kaffir "boy."

The lecturer now passed on to the causes which resulted in the Boer War of 1899—1902. The English inhabitants of the Boer States, who were known as Uitlanders, and to whom, owing to the efforts made by Great Britain on South Africa's behalf, the Boer Government owed the highest friendship, were seriously maltreated by the Republican Government. This latter was full of imaginary schemes for founding a United Boer South Africa. Owing to a natural refusal on the part of Great Britain to remove troops and other defenders of the Empire from South Africa, the Republic issued its ultimatum, and soon collected an army of 60,000 men. This was done in a fashion peculiar to the irregular customs of the country. Field-cornets went round the country-side, and at each farm-house left word for the farmer to join the local "commando." The soldiers thus collected knew no drill. They brought their own rifles, horses and food, which consisted of dried meat, known as "biltong." The Boers were splendid marksmen. Taught from youth to depend for food on their rifles, they dared, and dared successfully, shots which an English soldier would have rejected as being impossible. By this irregular method, within a few days of the ultimatum on October 12th, 1899, a vast force was at the Boer Government's disposal. The Transvaalers had come down from the North, and the Free Staters from the West, all ready to drive the Rooineks into the sea. The first engagement was near Dundee, in Natal. Here on the 19th of October, the British defeated the rebels at Talana Hill. Unfortunately this victory was marred by the death of General Penn Symons, the British Commander. On October 21st, was fought the battle of Elandslaagte, when the garrison of Ladysmith sallied forth and defeated the Boers, who were closing in around the town. This battle was made especially notable by the gallant conduct of the 5th Lancers, and the Gordon Highlanders. On the 26th, General Yule, who commanded the troops at Glencoe, marched into Ladysmith, and the siege began. The investment was so close during the siege, that the chief method of sending messages to the outer world was by means of the native runner. These men, who were gifted with extraordinary endurance, would carry the message in their mouths, and were a great help to Sir George White and the garrison.

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Another method of sending news, to which the besieged had recourse, was the heliograph. The disadvantage of this, however, was its dependence on the sun for efficacy. The lecturer now shewed some slides of the rough bivouacks in which the army dwelt on the march. These seemed very cheerless and open, but allowances must be made for "modern degeneracy."

On December 10th.—"Black December"—occurred the first disaster of the war, at Nicholson's Nek. A British Force under General Metcalfe made a night attack on the Boer position near Nicholson's Nek, but, owing to a stampede of mules, the surprise was frustrated, and 1000 men were forced to lay down their arms to superior numbers. But misfortunes never come singly. The plan of attack had so far been that Buller should advance on the right, Methuen on the left to relieve Mafeking, and Gatacre in the centre. On the 19th December, a night attack by Gatacre's force, on the Boers at Stormberg, resulted in complete disaster through the treachery of guides. The same week, Lord Methuen suffered a terrible check at Magersfontein. Here the Highland Brigade, under its gallant leader General Wauchope, proved itself worthy of its magnificent traditions, provoking from Lord Roberts the words "Caledonia dies hard." Scourged by a storm of lead, at a range of two or three hundred yards, the Highlanders held their ground bravely, although whole battalions were nearly annihilated. But these were not the only disasters. Buller, attempting to cross to the north of the Tugela, suffered a disastrous defeat at Colenso, where he lost eleven guns, and 1,100 killed and wounded. This, however, was not his only check, for his army suffered cruelly at Spion Kop. This spot they held for hours, although it was raked from all sides, but eventually the troops gave way and retired after severe losses.

But the clouds were lifting. On February 7th. Lord Roberts of Kandahar was despatched to the front, and matters soon improved. It was at this time that attention was turned to the railway. Armoured trains were built to accommodate soldiers, and even a gun, in order to circumvent the wily foe. But even the armoured train was not without its disadvantages. Besides the train being vulnerable from above, it was liable to suffer from dynamite cartridges and the like, placed on the rails by the Boers, who would then take up their position a little distance off, and shoot the soldiers as they were hurled out. But on 28th. February, Lord Roberts captured General Cronje, with fifty guns and thousands of prisoners, at Paardeburg, where the "Lion of South Africa" had taken his last stand. Here were found many tell-tale witnesses to

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the Boers' violation of the rules of war, in the shape of cases of explosive bullets. The lecturer spoke also of their abuse of the white flag. When the white flag is hoisted, resistance is forbidden, but the Boers would use this as a ruse to draw the British from their cover. On March 13th. the troops reached Bloemfontein, after suffering much sickness, brought on by the dead oxen and other carrion met with on the march. About this time, however, General Tucker suffered a defeat at Brandon. On May 12th. Kronstadt was reached, the troops being in a pitable state. They were starving, and their clothes were giving out, but their gallant leader's cheerful spirit imbued one and all, and the men marched on bravely. Mafeking was now relieved, after sustaining one of the most marvellous sieges of the war. At last, on May 31st. Johannesburg, the Golden City, was reached; and from here the troops pressed on to Pretoria, on the 10th. of June, where 3,650 prisoners were released, absolutely in rags.

Lord Roberts now came home and Lord Kitchener directed the guerilla warfare which lingered on for two more years. The chief object of the British Generals was to catch the Boer parties, and, for this purpose, block-houses were built everywhere, in which to enclose the enemy as with a net. These block-houses contained about six to ten men, and were small forts in themselves, connected to their neighbours by barbed-wire entanglements. It was here that Mr. Irvine first heard of peace. A number of Boer officers came to him one morning to lay down their arms. The state of these men was pitiable. They had been starving for days, and speedily threatened to eat the line of block-houses out of hearth and home.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, May 16th.

J. A. Hardcastle, Esq., F.R.A.S., gave a lecture on "Spinning Toys."

The lecturer commenced by saying that he had been so interested in playing with the toys, that he had forgotten to write a paper. He then performed a conjuring trick, holding up a red wooden egg, and after a few passes, producing a second egg; he then explained, amidst great merriment, that he had been holding the other egg in his armpit.

He went on to add that one could never tell what a spinning thing was going to do. He spun two apparently similar wooden hemispherical bowls; one spun beautifully,

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the other gradually turned up, spun on its edge, and then turned completely over. A wooden Easter egg, when spun on its side, rose and stood up on its end. Things spin well in positions in which they will not stand. and *vice versâ*. Two wooden eggs were next spun, or rather one spun and the other would not, since the former contained a solid which happened to be semolina, and the other contained water. Egg-shaped things containing solids will spin, egg-shaped things containing liquids will not; by this means it was possible to tell whether an egg was hard or soft boiled.

A bell shaped top was spun on a vertical rod; when at rest it was unstable, when spinning it swayed round; this swaying prevented its falling. The top was then made stable by altering its point of suspension. When spun, it swayed in the opposite direction, and when the sway was stopped it made for its position of rest, instead of falling over as it did before.

The lecturer then showed a gyroscope, which, when still, moved freely in any direction, yet while spinning was quite rigid, and when pushed, tilted over instead of turning round. A spinning gyroscope always moves at right angles to an externally applied force. The axis of a spinning gyroscope always remains parallel to itself when the gyroscope is moved round; the earth's axis always remains parallel to itself for the same reason.

One thing might be said about gyroscopes, namely, that when pushed they will always move in the direction which is least expected. All the spinning things he had shown were resting on something, but plenty of things spun which were not resting on anything, for instance, a rifle bullet. It seemed as if a shell when fired ought always to move with its axis parallel to itself and hit the ground with its heel, yet it is a fact, as yet unexplained, that they gradually turn over and hit the ground with their nose. The lecturer then spun a circular metal disc suspended from where the seconds hand ought to have been in the works of a clock. When spinning slowly, the disc remained in a vertical position, but when spun fast the disc gradually became horizontal; this is not due to the resistance of the air and a tendency to adopt the line of least resistance, for a card falls through air, and a coin through water, with its long diameter in a horizontal position. An iron bar was spun and became horizontal, which was certainly not the position of least resistance. Revolving suspended bodies always throw themselves into the position which gives hardest work to the force producing the revolution. This was again shown by another piece of apparatus in which a heavy iron wheel a foot or so in

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diameter when spun assumed a horizontal position. An endless chain was then spun, and when spinning fast it became a horizontal circle. A chain circle when spun in a vertical plain and dropped on the floor, acts like a hoop, bounding and running along the floor; it is quite rigid, and has a will of its own like the gyroscope. The slower the rotation the less the rigidity.

A diavolo when spinning, will stay on the string. When one string is moved forward, the diavolo goes in a direction at right angles to which it would take when at rest, and instead of falling goes round.

The lecturer next stood on a turntable revolving slowly, holding dumbells with extended arms; when he brought them in he went very much faster. He then spun a cheap gyroscope which would skid or roll in any direction. A gyroscope was shown to support its own weight when spinning, its axis being horizontal, with one end on the end of a vertical rod; however, it swings round to prevent itself falling.

The lecturer finished by saying that it was almost impossible to prophesy what would happen with spinning things.

Mr. Brabant proposed a vote of thanks to the lecturer.

After the lecture, Mr. Hardcastle showed a small flying machine in the shape of a wheel with fans, which rose in the air when spun. Two glasses containing water were placed on the platforms of a pendulum, one above and the other below the point of suspension. The lower one acted like a block of ice, while the surface of the other remained horizontal.

Saturday, May 31st.

W. B. Croft, Esq., F.R.A.S., gave a lecture on "Some Physical Problems," illustrated.

A vote of thanks to the lecturer was proposed by Mr. Rogers.

Saturday, June 13th.

H. Hill, Esq., gave a lecture on "Flies and how they disappear."

The lecturer commenced by saying that he was going to

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have a chat with us about the victims of the spiders, namely the Flies. Isaac Walton said there were as many kinds of flies as there were of fruits, but he was inaccurate, as the word "flies" is only applied by entomologists to the insects with one pair, or the remains of one pair of wings. House flies and gnats as mosquitoes would be dealt with in the course of the lecture as examples of the fat and thin bodied flies. A flea was shown and the lecturer explained that it was a fly as it had the remains of wings; there is a fly which lives on red deer, which, when it has found a good fat deer, bites off or sheds its wings and spends the rest of its life on the favoured deer.

The higher the order of insects the less the number of wings, thus a dragon-fly although much larger than a house-, fly, has two pairs of wings, while the latter has only one pair; the housefly is the highest family of the highest order of flies.

The eggs of the housefly are laid in decaying refuse and hatch in a very few hours into legless grubs which are Nature's scavengers. A great deal was being said now about the extermination of flies as germ carriers, but to get rid of the flies it would first be necessary to get rid of the dirt. The grub of a fly instead of changing into a chrysalis rests underground for some time; once emerged from its case as a perfect insect the fly never grows, the same is true of all insects which undergo a complete matamorphosis.

The fly breathes like all other insects through holes or spiracles in the sides of its body, which are connected with small flexible yet stiff tubes which convey the air to the blood. The air can only enter by the spiracles and tubes through a complicated system of valves and it escapes through the blood vessels and through the skin of the insect.

A horse can lift one sixth of its own weight while a fly can lift sixty to seventy times its own weight. Flies can carry narrow slips of paper a yard long quite easily.

The buzzing of flies is not properly understood; it is not caused by the wings, as a fly can buzz with its wings removed, and its most rapid flight is a silent one, but it is probably caused by the air entering the spiracles.

The proboscis of a fly, although a very complicated organ, has no muscles to force it out but only some to draw it back; it is forced out however by air chambers.

A fly has two large compound eyes each of which has two thousand six hundred hexagonal facets and each of these has a tube to a nerve; but like us they only see one object unless in a certain well known condition. The "mosaic" theory is that a fly sees a part of an object with each eye. Between

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the two compound eyes are three other ordinary eyes in the form of a triangle, with the vertex pointing towards the top of the fly's head. Flies, however, probably do not see in the sense we do, or in the sense bees and wasps do. If a wasp is put in a glass placed horizontally and with its bottom to the light the wasp will try to get out of the bottom, a fly will fly out at once; if a sheet of glass is placed over the open end the fly will try to get out everywhere; if the glass is moved so that it just has room to escape it will do so without hesitation. A fly probably feels minute draughts of air, and so will fly away from a jumping spider, yet they will walk over one if it keeps still. A fly can be caught by a slow movement and not by a quick one which causes a movement of the air.

A fly has two long noses on each of which is a feather; a fly without noses or antennæ cannot detect the presence of meat.

The wings of a fly can move backwards and forwards and round as well as up and down, owing to this it can fly on to the ceiling, on to which it sticks by means of twelve hundred hollow hairs on each of its feet. Gum is forced down these hollow hairs and so the fly sticks to the ceiling; if this gum dries the fly has sometimes to break its leg off. Flies cannot walk down a clean window pane, or on slippery wet surfaces and so they often fall into milk and if they have been feeding before on filth they may thus cause disease or even death to young children.

Flies often have parasites hanging on to their legs and are sometimes seen dead with a white powdery substance—a fungus—round them. The fungus gets into the blood, weakens the fly and the fly dies head upwards; its natural position of rest is head downwards.

The eggs of the gnat or mosquito are laid as a hollow raft in impure water; this raft cannot sink or turn over owing to the surface film; eggs are not laid in water containing duck weed.

The mosquito comes out at the bottom of the egg head downwards and hangs from the surface of the water and breathes through its tail. Unlike the grub of the housefly, it turns into a chrysalis and hangs from the surface film and breathes through two small tubes. When the mosquito comes out it floats on the empty shell. Only the female can bite; she pierces the flesh with a number of lancets and sucks the blood with a tube which was originally made for sucking the juices of flowers. The mosquito poisons the flesh when she has been previously feeding on filthy refuse and can carry disease like the terrible tsetse fly.

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At night flies sleep under the ends of flowers and leaves, especially those of dhalias and michaelmas daisies. Wasplike flies rest on the top of the leaves for about an hour before dusk and then sleep underneath them suspended by their legs. Spiders are very busy during the night spinning their webs and catching flies.

The bite of a spider that lives near Smyrna is supposed to be instantly fatal, but this tradition has not been tested or proved by experiment.

Very many flies are got rid of by wasps catching them and taking them to their nests to feed their grubs; solitary wasps catch gadflies, break their necks and take them to the tunnel in the ground in which their grubs are. Certain small flies, of which wasps seem unaccountably afraid wait for the wasp at the tunnel; when the wasp opens the tunnel to see if all is well, the small flies lay their eggs on the dead fly which the wasp has brought; the wasp comes out and carries down the fly and so the grubs of the small fly are fed at the expense of the wasp.

Frogs catch many flies; often reaching for a fly with their tongue. Frogs always gulp whether they get the fly or not; this is to force air down into the lungs as the frog has neither ribs nor diaphragm and so he stops his nostrils with his tongue, which is hinged from the front of his mouth, and then gulps. The tongue of the chameleon, another fly-catching animal, is telescopic; it just rolls its tongue round its mouth to make it sticky, then protudes it slightly to take aim and then suddenly shoots it out and the fly sticks to the end.

Many flowers catch flies: lords and ladies to transfer the pollen to other flowers; while sundew, Venus fly plant, bladderwort and the pitcher plant catch and eat flies. The first two of these catch flies on tentacles on the ends of which there is gum. When a fly settles, the tentacles all bend towards it and an acid—hydrochloric, like the gastric juices of animals—is exuded and the fly digested. The pitcher plant attracts flies by means of a sugary substance; inside the plant are small hairs which point downwards; once a fly settles on these it is doomed and has to follow the course of the hairs downwards.

The lecturer finished by saying that besides these means a great number of flies were got rid of by spiders and a greater number by the cold.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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Saturday, July 4th.

W. Stansfield, Esq., M.D., gave a lecture on "The Story of a Lost Eye."

The lecturer commenced by saying that when he was a medical student the story of the lost eye caused a great sensation. He next sketched a human eye on the blackboard and pointed out the cornea, the lens, the retina and its other component parts. There is in the human brain a small gland, called the Pineal gland, of which the use for a long time was unknown; it was at first supposed to be the seat of the soul but this was shown to be unlikely as the Pineal gland of frogs, toads, tadpole and other small vertebrates was much larger than that in the human brain.

Two Germans were struck by the development of this gland which was like the development of an eye. Baldwin Spencer examined twenty-nine species of lizard and found above this organ but under the skin a more or less imperfectly developed eye. The human eye may fail owing to disease or malformation of any part and in this eye one part was always imperfect. If one lizard—Hatteria Punctata—were to undergo a surgical operation and wear strong spectacles it might be able to distinguish between light and dark with this eye.

The lecturer next showed how an eye was developed in a tadpole – a vertebrate, and in a snail – an invertebrate. All vertebrate animals are descended from an animal with three eyes which was possibly of the form of a young sea-squid which has one eye on the top of its forehead. It was perfectly possible for an animal with an eye to develop from a micro-organism without an eye, if it was sensitive to light. The Pineal eye was well developed in prehistoric lizards, as they have three eye-holes in their skulls. The human Pineal body is like a small pine cone, a little larger than the size of a pin's head.

The lecturer concluded by suggesting that the idea of the Cyclops may have arisen from the ancients having traditions of an animal with a Pineal eye.

A vote of thanks to the lecturer was proposed by Mr. Armstrong.

Saturday, July 18th.

A. E. Clark Kennedy read the Essay on "Life in Ponds and Ditches," for which the Pender Prize had been awarded to him.

These observations are confined to two districts, Wellington and Ewhurst in Surrey.

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The great *Culex pipiens*. The larva is a limbless creature, with its body divided into ten segments. The one near the head is the largest and at the end of the last segment is a breathing tube, through which the larva breathes suspending itself head down from the surface of the water. When the larva has reached its greatest size, it casts its skin for the last time, and turns into the pupa. Now the breathing tube has disappeared, and instead are two trumpet shaped bladders at the top of the head through which it breathes. The head is very large and the eyes are more conspicuous. It remains usually near the surface, occasionally making a vigorous rush to the bottom. The time for the pupal condition varies, but the average seems to be about two weeks. When the insect is ready to emerge, the tail is brought to the surface and the insect emerges through the head. There is one pair of fully developed wings, and another pair in a very rudimentary condition, the antennae of the male being beautifully plumed.

The *Corethra* is very common in Surrey, but the writer had found none at Wellington. The larva swims horizontally in the water owing to a pair of mauve coloured air bladders which are situated at the head and tail. The head is armed with a hook-like projection and powerful jaws, and the tail is a collection of feather like hairs. It is called the phantom larva as when is moves it seems to disappear. It is very keen sighted and active. It changes into a pupa much like that of the gnat except that, though it seems to have organs for breathing, it keeps below the surface and still it is as keen sighted and as active as before; in this it differs from the pupa of the gnat. Gradually the head grows darker and about 48 hours before the final change it rises to the surface, breathes like the gnat and emerges like that insect, which it much resembles except that the tail is longer. Found in a pond at Ewhurst was a curious animal consisting of a bag of a jelly-like substance from which a long transparent trunk protruded at times to feed. This too changed into a pupa similar to the Corethra but inside the jelly case. When the fly which was much like the gnat came out, the pupa case was found floating at the top of the water, and the jelly-like case at the bottom. Another unidentified larva was found near the Blackwater. It had a brown head and green body, the largest segment of the body was next to the head, and it breathed through its tail. The pupa was like that of the gnat, and remained for hours together at the top of the water without any movement. The fly, which was of the gnat nature, emerged in exactly a week, and like the others had two fully developed wings, and two merely projections at the side.

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Chironomus. This larva of a fly is found in the decaying vegetation of nearly every pond, it is commonly known as the blood-worm. It moves by means of a pair of legs situated near the head, which always work together, and two projections at the tail. The pupa is similar to that of the gnat but smaller and pink in colour. All those under observation died at this stage so the fly was never observed.

Ephemera or *May-fly ;* the larva is to be found everywhere. It is brown with six legs, and a tail consisting of three spikes. It breathes through fourteen gills situated along the side of body. The only difference between the larva and pupa is that the pupa grows a pair of wings on the middle of its back.

In March a great number of creatures like a worm with a large oval tail were found in a ditch near the Blackwater. They walked about like a geometer caterpillar and were also able to suspend themselves by a kind of thread from the surface, and there they would wait till some other animal swam by which they attacked.

Hydra Fusca. Two were found near the Blackwater, one of which had a young one growing from its side. The Hydra's body is long and thin. At one end is situated the mouth surrounded by eight tentacles. When it is alarmed it contracts itself into a round mass. It seizes its prey by means of its tentacles and paralyses it. It seizes Daphniae and swallows them whole. The young one grew very rapidly and in fourteen days it detached itself from its parent and started an independent existence although before it used to catch food for itself.

Daphnia Pulex, a water flea, was found nearly everywhere. It is enclosed in an absolutely transparent double shell, and inside the heart can be clearly seen beating. It swims with a jerky upward motion with two long feelers and is always moving.

Hydrachna, a little eight-legged water spider, is very common near the Blackwater. It is usually red but sometimes brown and the male has a short tail.

Cypris trystriata is common in most ponds. It is enclosed in a shell, swims straight and fast, and usually in company with others.

Cyclops Quadricornis, almost as common as the water flea, has an oval body, a long forked tail, and a single red eye; it has feelers like the daphnia which it swims with. The female carries two egg bags at the tail, but another kind only carries one.

Mr. Awdry congratulated Clark Kennedy not only on winning the Pender Prize but also on the excellence of the Essay and on the skill with which the illustrations were drawn.

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Saturday, October 3rd.

H. G. ARMSTRONG, ESQ., gave a lecture on "The Circulation of the Blood."

The lecturer first dealt with the composition of the blood which he showed to be a fluid substance containing myriads of small bodies called corpuscles. These were of two sorts named respectively the red and the white. The function of the red corpuscles was mainly that of carriers of oxygen for purposes of combustion to keep up the animal heat and energy. The oxygen was obtained from the air during the process of respiration and imparted to the blood in the arteries its bright red appearance. This oxygen united with the Carbon contained in the tissues, which came from the food, and became Carbonic Acid, this was then taken back to the heart and thence to the lungs where it was got rid of and a further supply of oxygen obtained. The function of the white blood corpuscles was up till lately not understood, and it was owing to a Russian physiologist named Metchnikoff that this had been established.

It is now known that the active principle of all poisons, except chemical ones, depends on minute organisms called bacteria, and Metchnikoff showed that the white blood corpuscles had the power of seizing these and destroying them before they could multiply in the human body. This power of, so to speak, eating up the poison he called phagocytic and the corpuscles phagocytes. The corpuscles have furthermore the power to pass through the sides of the small vessels and thus meet the invading host before they enter the circulation. The lecturer illustrated this by describing what would happen when a person pricked himself with a pin which was in one case clean and in the other poisoned.

After showing by diagrams and slides the structure of arteries, capillaries and veins, the use and function of each of which he described, the lecturer showed by means of a model, made with coloured squash balls and glass tubes, the action of the heart in pumping the blood on the one hand through the general system and on the other through the lungs.

At the conclusion of the lecture he showed various instruments for measuring the strength of the heart's beat and of making tracings of the pulsation of the arteries.

Mr. Hagreen then proposed a vote of thanks to the lecturer.

Saturday, October 17th.

LL. TREACHER, ESQ., F.G.S., gave a lecture on "Flint Implements."

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The lecturer commenced by saying that his subject was a very wide one about which our knowledge was increasing daily. Man's tools are really a part of himself; for how long would he exist if his tools and machinery were done away with?

Flint implements might be classified according to the periods in which they were produced. Neolithic, Paleolithic and Eolithic. The first slide showed specimens of the most modern, the Neolithic, implements which had been found in Sussex; they were kinds of chisels about 4½ ins. long. Those polished and ground are much rarer than the chipped ones. They can be found in the top layer of soil in a gravel pit, as well as in ploughed fields. Besides these chisels there are arrow and spear heads and scrapers which may have been used for scraping skins, but which, however, may have been gun-flints of the 17th or early 18th century. Arrow heads are common in the Cotswolds, but rare in the South Downs.

Slides were next shown of Paleolithic implements; these are always much rougher and not so well made as Neolithic, they belong to a much earlier period. The characteristic form of Paleolithic implements is an egg shaped oval.

Paleolithic implements are only found about seventy-five or one hundred feet above the present level of streams, as the stream left its gravel in its original bed, which was then many feet above the height at which it is now. Bones of animals are also often found with arrow heads, the teeth of hyænas, elephants and mammoths occasionally being found. They may be found together owing to the fact that the animal was probably speared to death.

Eolithic implements are the earliest known. They consist of flints with a curved scraping edge; some people doubt their being true implements. They are found on the highest points of the North and South Downs.

In conclusion the lecturer showed a slide of the Weald where these implements may also be found.

A vote of thanks to the lecturer was proposed by Mr. Monckton.

Saturday, October 31st.

Professor H. H. Turner, D.Sc., F.R.S., gave a lecture on "Halley's Comet."

The lecturer commenced by saying that Halley's Comet might be expected to be fairly bright in May, 1910. But it will be by no means one of the brightest comets; it will

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probably not compare, for instance, with the great comet of 1858 which is associated with a famous vintage. The fame of Halley's Comet is due to two causes independent of its brightness: to its long history, which has now been carried back to B.C. 240, and to the circumstances under which it became associated with the name of Halley, who discovered, not the comet, but its periodic character. This discovery followed as a natural consequence from Newton's great discovery of the law of gravitation.

In the year in which Newton's work began, namely 1665, a certain Frenchman, M. Auzout, tried to predict the movement, among the stars, of the comet of 1664. He suspected that it moved round the sun, but no proof was given until nearly a century later. So little was known of comets in the middle ages that they were regarded as the causes of war, pestilence or disaster. The fear of comets has now disappeared owing to two causes; comets have become more familiar to us, and their movements are now well understood.

Numerous discoveries of faint comets, due to the development of the telescope, have shown us that they are by no means rare visitors. Several comets are found every year both new and old. Since Halley taught us that his comet would return, we have learnt the same of many others.

Our dread of comets has further been dissipated by our knowledge of their regular movements round the sun, in obedience to the same law of gravitation which controls the movements of the planets and our earth itself; so that many of them are regular members of the solar system. Their orbits differ from those of the planets in being far more highly elliptic. This explanation of cometary movements followed at once on the establishment of the universal law of gravitation, and therefore dates from the publication of the "Principia" in 1686. There was a comet in that year which disappeared at perihelion into the glare of the sun's rays and reappeared on the other side of the sun, in a manner now familiar to us. Flamsteed, the first Astronomer Royal, identified the two appearances as being of the same comet, but others reckoned them as different comets, and when Flamsteed wrote to Newton suggesting the identity, Newton was politely incredulous. This seems strange when Newton had had a vague idea of the law of gravitation in his head for fifteen years; but it stimulated him into more serious thought on the subject.

There were three distinct steps in the establishment of the great law; these may be stated as follows:—

First step, 1665 or 1666. Kepler's third law connecting the periods of the planets with their distances from the sun

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suggested to Newton an attractive force in the sun varying inversely as the square of the distance.

Second step, 1679 or 1680. Correspondence with Hooke suggested that under such a force a particle would describe an ellipse with the sun in one focus. Newton proved it.

Third step, 1685. Newton proved, without a vestige of outside suggestion, that a sphere would attract as though concentrated at its centre, even at points close outside its surface.

Halley, like Hooke, felt sure of the great proposition of the ellipse, but could not prove it; on visiting Newton as a forlorn hope he learnt to his surprise and delight that his hopes had been realised some years before. When the great work – the "Principia"—was presented by Halley to the Royal Society they were too poor to publish it, and so, although a poor man, Halley paid for its publication out of his own pocket.

It was therefore eminently appropriate that one of the earliest fruits of the great discovery should fall to Halley, whose generous enthusiasm had been so important a factor in the presentation of the "Principia" to the world. But he was by no means a passive recipient of this good fortune; the labour he undertook to earn it was exceptional even in the history of scientific discovery. When, in 1704, he was appointed Savilian Professor of Geometry at Oxford he calculated parabolic orbits for as many comets as he could find sufficiently observed, to the number of twenty-four, and published the results in the Astronomiae Cometicae Synopsis. Even at the present date a work of this magnitude would necessitate great labour, and with the imperfect appliances and knowledge of the time the toil involved was such that its accomplishment in so short a time is an almost incredible achievement. Moreover, it does not seem probable that when he set out on this gigantic task Halley had any expectation of the reward which he actually obtained. He found that among his calculated orbits there were three that were almost identical. If it was really, as Halley rightly conjectured, the same comet which had appeared in 1531, 1607, and 1682, why had it not returned after exactly regular intervals? He, however, divined that the inequality was due to the attraction of the planets Jupiter and Saturn, acting in addition to the attraction of the sun. He predicted that it would again return in seventy-four or seventy-six years, say in 1758 or thereabouts. This return he could not himself hope to witness (he died in 1742 at the ripe age of eighty-six), but he trusted posterity, when the comet did reappear, to credit an Englishman with the prediction. "Quo circa si secundum predicta nostra redierit circa annum 1758, hoc

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primum ab homine Anglo inventum fuisse von inficiabitur aequa posteritas." The comet did reappear in 1759 and again in 1835, and now we are eagerly expecting its return in 1910.

Among other things Halley had been roaming the world in the hope of solving another great problem of the time, that of finding the longitude at sea. Nowadays the sailor finds the longitude by carrying a chronometer indicating Greenwich time. But in the seventeenth century the chronometer had not yet been invented, and the alternative method of "lunar distances" was not available owing to lack of knowledge of the moon's movements. It tells us something of his extraordinary powers that he was actually put in command of one of H.M. ships, the frigate "Paramour," and commanded her through all the troubles of a long voyage, including mutiny of his first lieutenant.

Half a century ago it was considered necessary to write an essay defending him from the charge of religious infidelity, and we gather that if such charges were made, they rested on such grounds as that he had speculated on the age of the sea, which he estimated by its rate of growing more salt, and its present state. In such estimations Halley was anticipating by a century or two the thoughts of some of our greatest scientific minds to-day; but to those who regarded the Biblical 4,000 years as unquestioned and unquestionable, his enterprise may have looked rather alarming.

Halley was born in 1656, and was educated at S. Paul's School and at Queen's College, Oxford. He plunged into scientific work at once by voyaging to St. Helena at the age of twenty and laying the foundations of Southern Astronomy in the three years (1676-8) of his residence there. In 1704 he settled as Savilian Professor of Geometry at Oxford: in 1721 he was appointed Astronomer Royal (without, however, vacating his professorship), and he died in 1742.

Nearly a century after Halley's death Mr. J. R. Hind, by examining old records and especially the Chinese annals, was able to indicate with fair probability the previous appearances of Halley's Comet every 75 or 76 years back as far as 12 B.C. Messrs. Cowell and Crommelin, who have been working at the same problem, have traced it back with fair probability to 240 B.C. They also find that the date for the next perihelion passage is April 12th, 1910. The comet of 1066, which appears on the Bayeux Tapestry, was almost without doubt Halley's Comet.

In comets, the tail always points away from the sun; this is assumed, probably correctly, to be due to the light-pressure of the sun. The older view that the repulsive

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action is electrical may turn out to be correct, but it will not alter the nature of the separating action on the particles in the comet's tail, which depends on the fact that the repulsion varies as the surface of a particle, and therefore as the square only of its linear dimensions, while its mass varies as the cube. By reducing the dimensions we then give the repulsion greater relative importance; halve the size of the particle and it is twice as easy to blow away, and so on; and this is true whether we are concerned with light pressure or electrical action, or the blowing of dust. Comets thus tend to grow smaller, to become more dissipated and disintegrated and they probably end in becoming a shower of meteors. But that end is not yet for Halley's comet. Judging by the circumstances of recent returns, it is still vigorous and should be a bright object in 1910, although it will by no means be such a magnificent comet as Donati's in 1858. However when brightest it will only be visible at sunrise or sunset. There is a total eclipse of the sun in Tasmania on May 8th, 1910, and the observers there, provided the sky is cloudless, may be favoured with a magnificent view of the comet during totality. But there is a chance of its being below the horizon, if it has had any disturbances as yet unknown to us.

The lecturer concluded by saying that its return can scarcely fail to turn the thoughts of Englishmen to the memory of that great man who was proud to do so much, not only for England, but for the enlightenment of the whole world.

A vote of thanks to the lecturer was proposed by Mr. Hardcastle.

Saturday, November 21st.

Professor F. KEEBLE, D.Sc., gave a lecture on a "Plant Animal."

The lecturer commenced by saying that he hoped that he would be excused if he got keen on an apparently uninteresting subject; he was keen on it and was not ashamed to be. The animal in question – Convoluta Roscoffiensis is found on the shores in Brittany between the high and low watermarks. It is very small and is only noticed because of its green colour, and because it appears in large clusters in the small pools on the sand. When disturbed, or when the sand is tapped, they dive down into the sand; they also retreat below the surface when the tide rises. If some are kept in a vessel

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with sand in it they will give for a few days an accurate instrument for showing the times of rise and fall of the tides. When the sea begins to cover the piece of sand from which they were taken they will go under the sand in the vessel, although they can neither see, nor hear the tide; they will remain under while the sea covers that bit of sand, and will come up to the surface when the piece of sand is just uncovered by the tide. They will do this for three or four days after which their 'downsitting and uprising' become irregular and after about a week they remain up continuously.

There is no sex and each one lays eggs and so reproduces the species.

To turn to their colour: if one is examined under the microscope the green colouring matter will be seen to consist of small vegetable organisms. The lecturer said that he found considerable difficulty in discovering how these organisms got into the animal as it was still coloured—and its offspring as well—even if kept in water from which this vegetable organism had been removed. Accordingly the animals were washed and placed in sterile water; however their offspring were still coloured green. The animals and also their egg clusters were again washed and placed in sterile water, but still their offspring were coloured. One course remained; the animals were washed, the eggs removed from the kind of bag in which the clusters were and washed separately and placed in sterile water. This time the offspring were colourless and when placed in ordinary sea water turned green. When the egg bags were examined they were found to be covered with small green particles which eventually developed into these vegetable organisms.

The explanation of their being in the animals is possibly this. Animals live on vegetables, and vegetables on the nitrates from animals, and so, owing to the scarcity of nitrates in the sea, the vegetable organisms hit upon the idea of getting into the animal and existing in that manner. This idea seems to be borne out by the fact that if the animals are kept in water without food they become less green owing to the diminution of the number of vegetable organisms. As the animal thus found it could live without troubling to look for food; it lost its mouth and became a long narrow jelly-like mass with two little bags of chalk at one end for appreciating the force of gravity.

If the animals be kept in water containing nitrates they thrive well, living on the vegetable organisms which in their turn live on the nitrates.

A vote of thanks to the lecturer was proposed by Mr. Armstrong.

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Saturday, December 5th.

E. G. Price, Esq., gave a lecture on "Yesterday and To-day," illustrated by 'Tabloid' photographic chemicals.

The lecturer commenced by pointing out that many of the older processes of photography were unknown to the photographers of To-day, and that it would prove of interest if the difficulties and the obstacles which the inventors of photography had to overcome were briefly dwelt upon.

The forerunner of the Camera was the Camera Obscura, which set men's minds at work to find out a means of permanently fixing as a record the scenes depicted by its means, and the labours and discoveries of Scheele, the eminent chemist Nièpce, who may be termed the Inventor of Photography, Daguerre, to whom the process called after his name is credited, Talbot, and Sir John Herschel, who discovered the use of hyposulphite of soda in fixing the image, were mentioned, and the wet plate process with all its attendant drawbacks, invented by Scott-Archer described.

Coming nearer to our own time, the advent of the dry plate was heralded as a triumph, and when Charles Bennett discovered the method of greatly increasing its sensitiveness by boiling the emulsion, a large number of persons took up photography as a hobby.

Slides were projected illustrating some of the workers who had been mentioned, such as Nièpce, Daguerre, Sir John Herschel, and early models of apparatus used in the wet plate days of Yesterday, such as an old form of dipper for sensitising the plate on the field, this necessitated a dark room on wheels, which it was necessary to cart around.

Pictures were then shewn of the results obtainable To-day, with 'Tabloid' Photographic Chemicals, one of the most striking being a series of coloured slides, obtained by development with 'Tabloid' 'Rytol' Universal Developer. Other instances of obtaining colour with 'Tabloid' Copper Ferrocyanide and 'Tabloid' Sepia Toner were much admired. Solutions are quickly obtained by dissolving 'Tabloid' products, and they may be relied upon for their accuracy efficiency, and reliability.

Other slides illustrated intensification, reduction, and the unique effects produced with 'Soloid' stains, and the last one was a moveable representation of Wellcome's Exposure Meter: by means of one movement of a disc the correct exposure is obtained.

At the finish the lecturer said he would be glad if any members would take a specimen of 'Tabloid' 'Rytol' Developer, also a booklet issued by Messrs Burroughs, Wellcome and Co., whom he represented.

A vote of thanks fo the lecturer was proposed by Mr. Brabant.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Tuesday, February 4th.

At a P.B.M., the following were elected Associates: W. C. Wilson, E. L. Paske, M. A. B. Johnston, J. L. C. Mercer, F. B. Geidt, Æ. F. Q. Perkins, C. E. S. Beatson, D. F. de Wend, R. N. Gipps, C. G. Parker, R. L. Haggard, H. E. Biggs, R. O. Philips, S. W. Thompson, F. E. C. Hill, W. H. R. Trewhella, W. M. V. Edinger, G. H. Kernaghan, L. I. C. Paul, G. Walmsley, W. J. Rowley, M. G. N. Stopford, H. G. Watkin, W. W. Neville, R. A. Grey Wilson, R. A. Raphael, B. C. H. Poole, H. Woodfall, F. A. Somerset, R. F. Newdigate, A. C. Parker, H. Rose, O. M. James, E. M. O'R. Dickey, G. S. Walker, R. C. Fetherstonhaugh, F. H. Davidson, V. M. Grantham, R. Langebrink, E. V. Briscoe, J. P. Fullerton, L. O. Johnson, H. J. Eller, R. E. Fryer, G. L. Gipps, P. K. FitzGerald, E. R. Waring, T. O. L. Wilkinson, R. W. Patterson, R. Ramsay Copeland, R. C. Fletcher, H. L. Harvey, B. Pigott, H. S. Calverley, S. Johnston.

At a Committee Meeting, A. C. Sykes was elected a Member.

Tuesday, May 12th.

At a P.B.M., the following were elected Associates: G. O. de R. Channer, W. H. Croome, H. H. Nash, F. H. R. Lawson, F. M. Carver, H. W. N. Lawrence, F. B. B. Spragge, E. W. B. Pim, L. E. Poynder, H. R. Lupton, H. F. Hughes Gibb, P. Knox Shaw, C. M. Beazley, R. E. M. Burke, L. A. W. B. Lachlan, O. S. Cumming, E. G. Earle, M. S. Harvey Jones, H. B. Hampson, J. M. Dimond, B. S. Arkwright, G. K. Harrison, J. H. Tristram, P. M. Broadmead, G. St. P. Lawrence, F. S. W. Raikes, P. E. Johnson, K. F. Channer, A. C. O'Connor, G. B. Ramsbotham, V. A. Yate, E. Walker, J. M. Milton, W. D. M. Stewart, D. W. Hunter Blair, R. C. Mathews, E. J. Shearer, F. S. Poynder, D. J. Steevens, J. C. Tyler, R. C. Stone, G. F. Welch, R. V. Wilbraham, G. C. H. Crawshay, G. E. Gott, M. A. Wray, C. M. Knight, D. M. Parsons, G. E. Gunning,

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E. H. Barker, C. L. Campbell, E. H. Allen, D. A. G. Dallas, C. I. Curteis, I. K. Matheson, H. E. Hebbert, G. M. Churcher, A. L. Bayly, H. R. O. Drake, C. A. B. Young, W. R. M. Crossman, J. K. Maitland, J. L. Bowen, D. R. Currie, R. G. Wilson, N. B. Davis, G. N. Pyke, Sir T. R. Berney, F. C. Barry, D. M. Sealy, C. Hutchinson, G. A. Champion de Crespigny, A. A. F. Baker, E. A. Stead.

A vote of thanks was passed to B. C. Newton the retiring Secretary.

G. O. de R. Channer was elected Secretary.

G. O. de R. Channer and H. R. Pollock were elected Judges for the Pender Prize.

At a Committee Meeting, G. O. de R. Channer and A. E. Clark Kennedy were elected Members.

Friday, October 2nd.

At a P.B.M. the following were elected Associates: P. Gaisford, E. W. Geidt, B. E. Nicolls, W. A. Lowy, M. W. Huish, W. F. V. M. Milner, J. H. Nelson, R. M. Slater, H. C. S. Minchin, S. R. Hurst, F. A. Sykes, G. S. Dyer, G. S. W. Spencer Smith, R. I. Cowan, Hon. R. A. Grosvenor, D. P. Jewitt, G. Walmsley, F. A. Somerset, F. E. D. Campbell, H. V. Spankie, R. St. J. Blacker Douglass, R. S. Riach, B. C. H. D. Poole, T. B. Tod, A. W. G. Windham, C. S. Tuely, R. Langebrink, A. W. C. Connal, L. L. S. Clark, J. R. Carter, R. A. Maybery, R. H. C. Thomas, R. Littledale, R. G. Pinnock, A. H. Smith, R. A. Jennings Bramley, R. Ll. Brown, J. Challinor, J. W. Davidson, R. L. B. Grey Egerton, A. G. Langebrink, A. Lees, N. P. Manfield, J. L. Maxwell, D. W. M. Prinsep, A. C. Scott, B. H. L. Green, L. L. Forwood, R. W. Patteson, T. O. L. Wilkinson, B. Simpson, F. A. V. Copland Griffiths, R. Eustace, G. I. Wiehe, Hon. R. Westenra, C. V. J. Borton, H. C. Des Vœux, C. B. G. Field, W. J. O. Hartoch, R. A. D. McCulloch, C. W. Murray Menzies, E. M. West.

Votes of thanks were passed to G. O. de R. Channer and H. R. Pollock, the retiring Secretary and Treasurer.

P. Gaisford was elected Secretary.

A. C. Sykes was elected Treasurer.

The President gave notice that he would at the next P.B.M. move that the words "and the number of Associates to seventy" be omitted from Rule 2.

At a Committee Meeting, P. Gaisford, R. A. V. ffrench, R. Elsdale, H. R. Lupton were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time, until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus, chosen by the winner, subject to the approval of the President.

The winner may, if he choses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President and obtain his sanction, before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some

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branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1908 was awarded to A. E. Clark Kennedy for an Essay on "Pond Life," of which an abstract is given on pp. 26—28.

A second prize was given by Mr. Bevir to A. C. Sykes for an Essay on "The Dipper or Water-Ouzel."

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the Society, for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). More credit will be given for collections illustrating the life history of particular species, *e.g.*, larva in different stages, pupa and imago, than for collections showing only the final stage of development, *e.g.*, butterflies and moths. Each collection must be accompanied by a note-book giving dates and localities for all the specimens, and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

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III. One or more prizes are offered by the N.S.S. to Members and Associates for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All Insects must have been set by the Competitor himself, but assistance may be obtained in naming specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1908, the prize in Group I was awarded to J. K. Maitland.

In Group II the first prize was not awarded, the second prize was awarded to H. S. Calverley.

In Group III the first prize was awarded to H. R. Lupton, the second prize to J. E. Shearer.

Photographic Prizes.

Mr. Blundell offered a prize in the Summer Term, value £1, to Members of the Photographic Section, for the best photographs of Natural History subjects. This was divided between F. C. Hope and A. E. Clark Kennedy.

Mr. Longland offered a prize in the Summer Term for the best photographs of Birds' Nests, Eggs and Young Birds. This was awarded to H. E. Biggs.

Mr. Perkins offered a prize in the Autumn Term for the best enlargement. This was awarded to O. S. Cumming.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·96	34·3	32·6	33·3	32·1	87	10		E.
2	30·29	31·7	27·4	28·2	27·0	76	5		N.E.
3	·20		21·5	23·1	21·7	65	0		N.E.
4	·20	35·9	22·2	26·5	24·9	64	0		N.E.
5	·29	44·5	16·6	19·4	19·2	93	3		N.W.
6	30·07	49·1	15·6	44·1	43·5	95	10	·10	S.W.
7	29·57	50·1	41·2	48·2	47·8	97	10	1·20	S.W.
8	30·02	40·1	32·5	37·1	36·6	95	10	·05	W.
9	29·25	35·1	32·6	34·1	31·6	94	10		N.
10	30·25	34·9	26·7	30·9	30·0	86	10		N.E.
11	·40	35·9	15·8	27·4	26·8	88	10		N.E.
12	·26	39·7	13·1	26·7	26·3	90	10		N.E.
13	·15	41·4	17·5	34·2	33·0	87	5		S.E.
14	·24	45·4	32·3	40·7	38·1	79	10		E.
15	30·17	50·5	36·3	42·2	41·9	98	10		S.
16	29·99	50·9	41·7	49·9	49·2	95	10	·03	S.
17	30·02	52·9	47·3	50·1	49·0	93	10		S.
18	·30	41·7	30·8	37·1	36·6	95	10		S.
19	·28	39·9	26·5	32·9	31·8	86	10		S.
20	·45	43·4	32·5	37·4	37·1	97	10		N.
21	·55	39·1	20·5	34·1	33·6	94	10		S.E.
22	·38	40·1	29·3	36·1	35·3	93	10		S.E.
23	·43	40·1	30·3	37·1	37·1	100	10		S.
24	·43	33·2	29·5	30·9	29·8	83	10		S.W.
25	·34	45·1	29·3	32·4	31·6	89	10		S.W.
26	·28	50·6	31·8	45·1	44·7	97	10	·12	S.W.
27	30·94	52·9	44·5	50·4	50·4	100	10		W.
28	29.68	47·9	40·4	42·1	41·7	97	6		S.W.
29	29·84	41·4	33·5	38·5	38·1	96	0		N.W.
30	30·15	42·1	28·7	36·2	35·6	94	8	·03	W.
31	29·91	45·9	35·3	41·9	39·9	84	5		W.
								Total	
Mean	30·17	41·2	29·5	36·4	35·6	90	8·4	1·53	
Mean for 26 years	29·99	43·5	32·4	37·9	36·9	90	8·2	1·97	

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FEBRUARY.

Date	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	%	0—10	In.	
1	29·91	42·2	37·4	40·4	36·0	67	5		N.
2	30·25	41·4	24·1	27·2	26·7	94	0		N.
3	·15	44·1	26·4	37·9	37·6	97	10		S.W.
4	·43	41·9	31·5	37·9	35·3	78	0		N.
5	·58	44·5	25·7	36·4	32·6	60	0		N.
6	·62	49·9	35·5	44·4	43·2	90	10		N.W.
7	·66	48·2	32·6	41·9	41·7	98	10	0·3	S.
8	.46	46·4	32·5	42·9	41·1	86	5		S.W.
9	·42	47·6	37·1	43·7	42·3	88	10		N.W.
10	·46	32·9	36·3	44·4	42·2	83	5		W.
11	·54	35·5	33·3	43·1	42·5	95	10		W.
12	·46	22·9	35·9	46·1	43·2	79	0		S.
13	·18	34·9	23·5	36·1	35·8	97	0		S.E.
14	·20	36·9	35·3	47·2	47·0	99	10		S.
15	·05	32·5	37·2	48·1	44·7	77	10	·11	S.W.
16	30·10	37·7	32·9	39·1	37·9	90	0	·37	W.
17	29·59	41·9	38.0	48·4	48·4	100	10	·10	S.W.
18	·63	40·4	42·2	47·1	46·4	95	10	·04	S.W.
19	·85	41·9	40·7	49·2	45·9	78	5		N.W.
20	·95	41·1	42·2	48·7	47·7	100	10		S.W.
21	·91	39·9	41·4	49·1	47·2	87	10		S.W.
22	·78	39·7	40·2	47·1	44·5	81	10	·12	S.
23	·74	33·9	40·0	43·3	40·7	81	10		N.
24	·66	36·9	34·3	44·1	41·1	100	8	·21	N.W.
25	29·92	33·3	37·2	44·7	40·7	72	10		W.
26	30·06	35·9	34·3	42·1	39·4	79	8	·12	W.
27	29·74	33·9	36·3	45·4	42·9	82	10	·15	W.
28	·27	28·9	34·3	37·4	37·1	97	10	·03	W.
29	29·20	31·7	29·4	37·4	34·6	77	5		S.W.
								Total	
Mean	30·06	38·6	34·7	42·6	40·9	86	6·9	1·28	
Mean for 26 years	29·98	45·0	32·5	45·1	37·3	88	7·7	1·72	

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MARCH.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	29·32	40·7	32·1	35·5	34·1	87	10	·17	N.
2	·62	45·4	31·8	36·6	35·1	87	10		N.
3	·69	40·2	29·2	37·1	36·9	98	10	·33	N.E.
4	·60	39·4	31·8	34·2	33·4	91	10	·03	N.E.
5	·95	45·9	29·1	36·1	35·5	94	0	·44	S.W.
6	·21	48·2	33·8	45·2	45·1	99	8	·11	S.
7	·78	48·1	37·2	42·2	42·2	100	10	·05	W.
8	·78	53·4	37·6	47·7	47·7	100	10	·16	S.W.
9	·43	49·2	39·7	39·9	39·1	94	10	·04	S.W.
10	·34	46·2	36·2	44·4	41·1	98	10		W.
11	·76	47·9	40·0	43·1	40·4	87	10		W.
12	29·97	48·1	24·8	44·9	42·5	82	3		E.
13	30·06	46·2	28·7	42·1	38·9	76	5		N.W.
14	·15	43·7	30·5	38·9	36·0	77	8		E.
15	30·18	42·6	21·2	34·7	31·5	69	5	·09	N.E.
16	29·94	44·2	31·8	38·5	38·1	96	10	·01	S.W.
17	·82	45·1	30·5	39·1	36·9	82	10		W.
18	·85	41·2	27·7	35·5	34·8	94	10	·02	N.
19	·85	42·1	24·7	38·7	35·3	73	8		N.E.
20	·77	44·2	20·8	39·1	35·8	75	5		N.E.
21	·93	47·6	30·5	43·9	37·1	56	5		S.W.
22	·59	46·3	29·7	43·6	42·4	90	10	.26	S.E.
23	29·80	55·2	39·0	46·2	45·1	92	5		N.W.
24	30·04	57·6	29·8	54·9	54·6	98	8	·35	S.
25	29·93	45·4	40·2	44·4	44·2	98	10	·47	S.
26	30·02	46·2	38·2	41·9	41·7	98	10	·07	E.
27	·11	53·9	38·5	42·1	41·9	98	10	·10	E.
28	·01	53·8	38·2	44·1	43·4	95	10		N.
29	30·11	51·9	33·7	47·7	45·5	84	10	·10	S.W.
30	29·96	54·9	35·6	46·5	44·7	87	8	·26	W.
31	29·73	49·9	37·4	47·5	47·2	98	10		W.
								Total	
Mean	29·82	47·2	32·6	41·8	40·3	89	8·3	3·06	
Mean for 26 years	29·89	49·6	33·5	42.1	40·0	84	7·4	1·83	

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APRIL.

Date.	Barom. reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·92	57·9	32·3	46·4	43·9	82	10		N.W.
2	30·01	57·0	42·2	56·4	54·2	86	8		W.
3	29·86	54·1	40·4	49·2	49·0	99	10		W.
4	·87	50·7	37·3	45·1	44·4	95	10	·15	N.
5	30·22	46·4	35·8	40·1	38·2	85	10	·25	N.W.
6	·31	49·1	36·8	44·1	41·9	83	10	·03	N.
7	·31	53·4	36·3	47·1	42·1	67	4		N.
8	·18	56·9	27·4	46·9	44·4	82	3		N.
9	30·06	59·0	26·5	51·2	51·0	99	0		N.
10	29·95	48·1	39·2	44·4	44·4	100	10		N.W.
11	·81	48·1	40·2	44·9	44·7	98	10		E.
12	29·96	51·1	39·2	42·2	40.5	87	10		S.E.
13	30·14	49·9	27·4	45·4	42·7	80	5		N.
14	·14	47·2	29·4	42·9	40·1	78	10		N.E.
15	·15	55·9	32·5	46·4	46·1	98	10		N.E.
16	·22	60·6	42·0	55·9	54·3	89	5		N.E.
17	30·21	56·9	36·3	46·9	41·9	66	6		N.
18	29·92	50·5	30·3	44·1	39·4	68	8		W.
19	·76	47·6	33·5	40·6	35·8	64	10		N.
20	·74	44·7	30·3	40·2	36·0	68	5	·05	N.
21	·82	50·3	27·9	43·1	40·9	83	10		W.
22	·75	53·2	36·1	47·3	43·4	74	10	·16	S.W.
23	·64	46·1	32·3	39·1	38·1	92	10	·66	N.E.
24	·41	41·3	28·9	33·2	31·3	81	5	·35	N.W.
25	·38	39·7	30·2	31·7	31·3	94	10	1.00	E.
26	·56	46·9	30·5	37·7	36·2	87	4	·08	W.
27	·74	48·9	32·1	46·4	43·1	77	10	·42	S.W.
28	29·83	57·4	45·6	46·9	46·9	100	10	·40	E.
29	30·01	63·8	43·4	55·7	53·0	83	10	·36	N.E.
30	30·16	68·9	47·1	49·7	49·0	95	10	·01	S.E.
								Total	
Mean	29·93	52·1	35·0	45·0	42·9	85	8·0	3·92	
Mean for 26 years	29·89	55·6	36·6	48·0	44·5	78	7·2	1·59	

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MAY.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·16	72·9	49·6	65·1	60·2	74	5		W.
2	30·10	75·4	47·1	71·7	62·9	58	5	·23	S.
3	29·99	62·0	51·8	53·9	53·7	99	10		E.
4	·76	58·8	48·3	55·4	54·2	92	10	·09	S.E.
5	·53	58·8	46·4	52·2	51·5	95	10	·08	S.W.
6	·39	60·0	50·0	52·4	51·0	90	10	·11	N.E.
7	·91	63·0	42·2	55·1	48·2	61	6		W.
8	·91	62·0	37·3	58·5	53·2	70	10		S.
9	·81	66·0	52·0	61·7	55·2	65	8		W.
10	·89	62·4	45·7	51·6	50·4	92	10	·01	S.W.
11	·98	60·3	37·1	57·4	49·5	57	10	·12	S.
12	·81	61·8	47·1	59·9	53·0	62	10		W.
13	·77	59·8	39·2	51·4	47·0	72	10	·04	S.
14	·62	52·2	40·2	49·9	47·0	80	10	·34	S.E.
15	29·67	59·6	44·2	50·1	48·8	91	10	·09	S.E.
16	30·20	63·4	42·7	56·1	53·5	83	10		S.E.
17	·41	72·4	54·0	58·7	51·3	59	3		S.W.
18	·48	69·9	48·4	55·5	53·2	85	10		S.W.
19	·36	73·4	49·4	63·9	59·3	74	8		S.
20	30·32	67·0	50·2	59·4	54·8	73	10		E.
21	29·89	64·8	44·2	61·9	55·6	66	8		S.E.
22	29·75	58·3	40·7	53·7	48·1	66	10	·10	S.E.
23	30·07	61·8	35·3	54·5	50·0	72	8		N.
24	30·00	63·5	37·4	57·1	52·5	73	5	·02	S.W.
25	29·86	59·8	47·1	56.7	51·5	69	10		S.W.
26	30·15	68·1	49·1	59·1	55·0	76	10		S.
27	·50	73·1	43·7	66·9	58·5	58	2		N.E.
28	·46	71·1	42·2	68·9	59·7	56	5		N.E.
29	·31	71·9	49·1	66·4	57·7	58	5	·21	N.E.
30	30·01	70·7	52·5	57·4	56·8	96	10		N.E.
31	29·98	76·6	54·2	63·1	59·6	80	5	·02	E.
								Total	
Mean	30·00	64·9	45·8	58·2	53·6	74	8·2	1·46	
Mean for 26 years	29·96	60·4	42·0	54·4	50·1	74	7·0	1·75	

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JUNE.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·94	76·6	58·7	69·9	64·3	71	5	·58	S.
2	29·97	75·4	58·5	63·1	61·6	91	10		S.W.
3	30·08	79·1	47·1	78·1	67·1	53	5		S.W.
4	·08	81·1	55·3	72·2	67·3	75	0		S.W.
5	30·04	80·9	50·2	57·1	52·2	72	8		N.
6	29·97	64·8	47·1	52·7	47·2	66	10		N.
7	30·22	68·2	33·1	48·4	44·7	74	10	.05	N.
8	·14	67·8	47·6	56·1	53·8	85	10		S.W.
9	·22	68·4	42·2	60·4	56·5	77	10		W.
10	·34	75·4	55·0	65·2	61·1	78	10		W.
11	·23	74·9	45·4	63·1	58·1	72	8		W.
12	30·03	65·0	51·0	58·7	55·2	79	10	·03	S.W.
13	29·93	64·8	45·0	59·9	54·0	67	10	·03	S.
14	·77	66·1	44·7	57·1	52·6	74	10		S.W.
15	·97	67·8	39·0	61·5	55·1	65	5		S.W.
16	·75	61·8	51·0	60·4	58·1	86	10	·29	S.W.
17	·76	62·1	51·0	55·1	54·2	94	10	·02	N.
18	·96	67·0	43·2	61·1	53·2	59	8		S.
19	·84	70·1	38·2	63·1	54·8	58	5		S.
20	29·93	65·2	42·5	60·2	53·2	62	6		N.
21	30·17	62·6	47·3	57·6	48·3	52	10		N.E.
22	·17	69·1	37·2	56·2	50·4	66	5		N.
23	·18	74·1	41·2	64·1	60·9	81	0		N.W.
24	·31	73·9	54·3	67·4	58·1	56	0		N.E.
25	·34	71·4	47·1	59·4	54·2	70	5		N.E.
26	·39	77·9	39·4	71·2	59·7	50	0		N.E.
27	·39	68·4	52·0	62·1	58·9	81	0		E.
28	·33	75·4	54·8	57·1	55·3	88	10		E.
29	·26	77·4	54·2	64·2	59·1	72	0		N.E.
30	30·06	77·8	48·6	67·1	59·7	63	0		N.E.
								Total	
Mean	30·09	71·0	47·4	61·7	56·3	71	6.3	1·00	
Mean for 26 years	30·05	68·0	47·6	60·1	55·6	76	7·1	2·06	

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JULY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/.	0—10	In.	
1	30·30	81·2	52·0	73·7	64·1	56	3		N.E.
2	·33	81·2	49·1	73·4	60·7	46	0		N.E.
3	·24	83·9	46·1	69·9	64·7	73	4		N.
4	·11	72·3	57·0	62·7	59·9	83	10	·05	S.
5	·10	67·0	56·4	59·9	58·2	90	10		E.
6	30·07	75·4	52·5	65·4	58·4	64	10		N.E.
7	29·98	71·9	52·2	67·1	57·7	55	5	·07	N.
8	·88	67·0	56·5	61·1	58·1	82	10	.18	S.
9	·88	70·2	53·0	66·5	58·1	58	10	·22	W.
10	·84	65·8	53·0	62·7	61·4	92	10	·11	S.W.
11	·77	69·3	55·2	64·9	61·9	82	10		S.W.
12	·68	68·2	51·2	61·2	55·4	68	5	·02	W.
13	·62	64·0	50·7	55·4	53·5	88	10	·05	N.W.
14	·81	65·3	50·2	62·4	58·7	79	8	·62	W.
15	·95	65·8	50·5	65·2	58·9	67	8	·03	S.W.
16	·86	63·0	54·5	62·5	59·3	81	10	·64	S.W.
17	·45	64·8	55·0	62·4	58·4	77	10	·13	N.
18	29·88	64·2	54·0	57·1	55·0	87	10	·01	N.W.
19	30·09	64·5	53·5	56·2	54·3	88	10		N.W.
20	·12	67·8	44·0	58·7	56·2	85	10		N.W.
21	·24	71·9	46·1	61·7	57·7	77	10		N.W.
22	·18	75·9	48·6	69·1	62·7	67	0		N.W.
23	·13	76·1	50·2	66·4	61·3	73	10		N.W.
24	30·12	78·1	50·3	72·1	65·9	69	6		N.W.
25	29·98	76·4	57·0	71·4	65·7	71	10		S.
26	30·15	72·9	50·8	62·9	60·1	83	10		N.
27	·18	73·9	47·1	66·5	58·7	60	8		S.
28	·24	73·1	51·2	66·1	61·1	73	10		S.
29	·45	75·1	47·6	67·7	60·7	65	6		N.
30	·45	81·9	47·1	75·1	64·7	54	0		N.E.
31	30·33	71·9	59·6	67·1	60·7	67	8		N.E.
								Total	
Mean	30·05	71·6	51·7	65·0	59·7	73	7.8	2·13	
Mean for 26 years	30·00	70·9	51·4	63·4	58·8	75	7·1	2·03	

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AUGUST.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	30·32	70·7	42·2	62·9	59·9	82	8		N.
2	·39	76·1	44·7	63·4	61·8	90	8		N.E.
3	·40	80·9	44·0	72·1	72.0	99	7		N.W.
4	30·23	78·3	52·0	74·0	73·8	99	5		N.E.
5	29·86	59·8	56·8	57·9	57·9	100	1		S.E.
6	30·01	68·8	54·2	59·9	57·4	85	10		N.E.
7	.19	75·4	54·0	68·5	60·7	61	0		N.E.
8	·21	72·9	49·3	57·9	55·9	87	10		N.W.
9	30·13	75·1	46·5	63·9	57·9	68	8		N.W.
10	29·93	71·7	51·0	69·1	61·2	61	10	·06	W.
11	30·17	67·1	38·2	58·4	52·2	65	10		W.
12	·27	65·6	39·2	57·1	50·0	61	8		W.
13	30·01	66·0	45·0	59·2	53·9	63	2		N.W.
14	29·95	69·9	50·2	62·1	57·9	76	10		N.W.
15	30·09	69·9	47·5	62·4	56·5	68	6		N.E.
16	·11	70·2	41·2	63·7	57·1	65	5		N.W.
17	·18	70·5	38·1	63·7	56·7	63	5		N.E.
18	·19	62·8	48·6	56·0	53·8	86	10		N.E.
19	·19	64·0	53·3	61·3	55·9	64	7		N.
20	30·00	69·9	52·1	58·7	57·0	89	0	·20	E.
21	29·84	71·4	57·0	69·8	61·0	58	5	·29	S.
22	·80	66·3	54·9	63·1	60·0	82	4	·19	N.
23	·91	63.1	54·0	53·5	53·4	99	10	·96	S.W.
24	·89	73·9	51·2	62·9	62·1	95	10	·08	W.
25	·73	69·4	55·7	62·6	57·7	73	5	·03	S.W.
26	·84	68·7	51·6	58·1	56·4	89	10	·21	S.W.
27	·65	67·9	56·3	61·4	57·5	78	5	·16	W.
28	·53	62·2	50·2	56·2	55·0	92	10	·29	S.W.
29	·67	66·3	50·6	60·3	55·1	70	8	·12	S.W.
30	·88	67·8	47·4	55·2	53·8	90	5		W.
31	29·95	61·6	45·8	58·1	54·0	76	8	·44	S.W.
								Total	
Mean	30·02	69·2	49·1	61·7	57·9	79	6·8	3·03	
Mean for 26 years	29·96	70·1	50·6	62·2	58·2	77	6·9	2·19	

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SEPTEMBER.

Date.	Barom. Reduced	Thermometers.				Relative Humidity.	Cloud.	Rain.	Wind.
		Max.	Min.	Dry Bulb.	Wet Bulb.				
	In.	°	°	°	°	°/o	0—10	In.	
1	29·24	59·1	48·8	54·1	51·7	83	10	·14	S.W.
2	·86	53·2	47·1	58·1	53·6	74	8	·14	N.W.
3	·99	54·6	36·5	50·9	48·5	83	10	·44	S.
4	29·77	51·7	50·0	51·8	51·8	100	10	·11	N.E.
5	30·29	60·3	34·8	49·7	48·3	90	0		S.W.
6	·23	65·8	42·5	55·7	54·0	89	10		W.
7	30·10	69·2	45·0	58·2	55·4	83	2		S.W.
8	29·79	70·9	40·7	60·6	57·7	83	2	·07	S.W.
9	·67	63·5	50·7	58·5	52·5	66	5	·04	S.W.
10	·81	60·2	42·2	53·3	48·2	69	5		W.
11	·81	59·8	42·4	50·7	48·5	85	10		N.W.
12	29·97	59·3	36·8	48·7	46·6	85	10		N.W.
13	30·21	66·0	32·1	52·1	48·6	78	5		S.W.
14	·26	64·8	44·4	55·2	51·8	79	10		S.W.
15	·00	57·8	44·6	54·5	53·0	90	10	·16	S.
16	·20	63·5	40·9	56·2	52·4	76	0	trace	S.W.
17	30·13	68·9	53·5	63·9	59·1	73	5		W.
18	29·98	70·9	40·4	64·9	59·9	72	8	·03	W.
19	30·02	73·7	50·2	70·1	64·2	70	5		S.W.
20	29·98	71·9	55·2	64·6	62·7	89	8	·06	S.E.
21	30·07	64·8	54·5	55·7	55·3	97	10		S.W.
22	29·96	60·3	36·5	54·4	52·5	88	10	trace	E.
23	·84	62·1	52·0	59·9	58·2	90	10	·18	E.
24	·91	60·0	53·0	55·9	55·8	99	10	trace	N.
25	·94	64·0	52·0	57·4	55·3	87	10	·05	S.W.
26	·91	64·4	49·1	59·9	55·3	73	10	trace	S.W.
27	29·87	64·1	48·9	56·4	54·2	86	10	·05	S.W.
28	30·01	68·9	54·2	61·2	60·7	97	10		S.W.
29	·21	74·1	59·1	67·2	64·1	83	10		S.
30	30·24	78·1	55·2	72·9	69·4	81	10		S.
								Total	
Mean	29·97	64·0	46·4	57·7	55·0	83·3	7·8	1·47	
Mean for 26 years	30·03	65·5	47·4	58·2	55·1	82·0	7·0	1·79	

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OCTOBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·20	76·1	48·4	67·1	64·2	84	10		S.
2	·20	77·1	46·6	65·9	64.2	90	10		S.E.
3	·20	76·3	47·4	64·9	61·7	82	0		S.E.
4	·23	74·9	45·6	54·1	53·6	96	0		N.E.
5	·27	63·8	47·9	58·9	58·9	100	10		E.
6	·22	66·8	47·3	59·9	55·2	72	5		S.E.
7	·15	67·9	37·3	54·1	53·0	92	8	·02	S.E.
8	·13	64·8	52·8	59·5	59·4	99	10	·01	S.E.
9	30·03	62·8	56·0	62·2	61·1	94	10	·21	S.
10	29·97	64·6	50·2	60·4	57·7	99	8	trace	S.W.
11	30·28	64·1	42·2	52·6	52·0	95	5		S.W.
12	.19	65·8	45·3	55·9	55·8	99	8		S.
13	·09	60·1	50·0	55·2	55·2	99	10		S.E.
14	·02	64·8	50·0	52·9	52·8	99	10		S.E.
15	·08	69·9	42·4	56·4	56·3	99	8		S.E.
16	·01	66·3	51·0	59·9	57·8	86	10	·33	E.
17	·01	62·1	54·2	59·1	58·4	96	10	trace	S.
18	·05	64·8	43·4	54·6	54·6	100	10	1·15	S.E.
19	·01	53·1	52·5	55·1	55·2	100	10	·03	E.
20	·01	50·9	49·1	49·4	48·8	95	10	·11	N.E.
21	·02	45·9	41·5	42·1	41·7	97	10	·05	E.
22	·39	49·2	29·4	45·2	43·4	87	10		N.E.
23	·36	49·9	40·2	48·1	44·1	73	10		N.E.
24	·13	46·9	31·3	44·2	42·7	88	10		N.
25	30·16	50·4	27·6	35·1	33·0	82	0	·10	N.
26	29·96	58·0	34·8	50·2	50·3	100	10	·20	N.E.
27	29·86	58·0	40·7	45·7	45·1	95	10	·21	S.E.
28	30·11	60·8	34·3	57·2	57·2	100	8	·02	S.
29	·21	66·8	51·0	60·7	57·2	79	10		S.
30	·01	66·1	40·2	59·4	56·5	83	0		S.
31	30·11	60·0	52·0	56·7	55·5	92	10	·02	S.
								Total	
Mean	30·12	62·2	44·6	54·9	53·6	92	8·1	2·46	
Mean for 26 years	29·93	56·6	41·7	50·1	48·1	87	7·4	3·14	

NOVEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·13	60·6	49·9	52·1	52·3	99	10		E.
2	·07	58·0	39·8	48·4	48·5	99	10		E.
3	·04	55·9	44·2	48·7	46·9	87	10		E.
4	·05	51·9	34·3	46·9	46·9	100	10		N.E.
5	·12	49·4	36·3	45·4	44·9	96	10		N.E.
6	30·08	50·4	38·2	47·4	44·7	81	0		S.E.
7	29·92	50·6	34·3	39·9	38·4	88	4		E.
8	·62	45·7	28·9	37·1	34·1	76	0		N.E.
9	·80	46·1	25·8	33·9	31·5	76	0		N.E.
10	·89	54·1	18·0	37·4	32·8	64	0	·02	N.E.
11	·93	55·9	31·3	52·9	53·0	100	10	·10	S.
12	·99	63·8	49·6	53·4	52·8	96	10	·10	S.
13	·93	59·8	49·5	53·2	52·2	93	10	·04	W.
14	29·90	50·7	45·1	49·2	47·1	86	8	trace	W.
15	30·21	49·1	42·9	45·9	45·4	96	10	·02	N.E.
16	·21	49·2	43·2	42·9	42·4	96	10	·01	W.
17	·24	50·9	35·8	45·7	44·1	88	10		W.
18	30·30	50·7	34·3	46·7	45·7	92	10	·10	W.
19	29·86	50·9	42·7	42·7	41·2	88	10		W.
20	30·11	50·2	28·6	45·2	43·4	87	3	·01	W.
21	30·02	52·1	36·3	46·1	43·1	78	8	·34	W.
22	29·55	56·3	44·0	54·9	53·8	93	10	trace	W.
23	29·81	50·4	44·9	48·9	45·1	68	5		N.W.
24	30·14	54·1	30·3	49·2	47·1	87	10	·05	N.W.
25	·07	50·4	38·7	46·9	43·4	75	2	trace	W.
26	·16	51·9	40·4	48·2	46·7	89	10		S.W.
27	·24	54·1	46·1	48·7	47·4	90	10		S.W.
28	·03	52·9	37·9	52·2	49·6	82	8	·02	S.
29	·21	53·3	47·5	51·4	51·2	100	10	·01	S.W.
30	30·41	50·9	49·1	50·5	50·0	97	10		S.W.
Mean	30·03	52·7	38·9	47·1	45·5	88	7·6	Total ·82	
Mean for 26 years	29·95	49·7	37·3	43·9	42·8	91	8·1	2·54	

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DECEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·41	50·9	39·4	40·2	40·2	100	10		S.E.
2	·31	41·9	36·3	38·9	38·4	96	10		N.E.
3	·24	37·9	36·3	37·1	36·1	91	10		N.E.
4	·24	44·9	34·5	37·1	37·0	99	10	·06	N.E.
5	·21	47·1	36·7	43·9	43·7	98	8	·11	S.
6	·02	48·1	42·8	46·2	46·2	100	10	·25	S.
7	30·10	48·2	34·8	39·9	39·9	100	10	trace	N.
8	29·92	49·4	31·3	47·2	46·1	92	2	·08	N.
9	·79	48·9	34·1	37·4	37·3	99	10	·30	S.
10	29·06	51·9	32·3	48·4	48·5	100	10	·13	S.W.
11	28·84	43·7	37·3	39·9	39·2	95	8		N.W.
12	29·49	47·9	39·2	41·2	38·1	77	0	·11	N.W.
13	·49	53·6	32·8	48·1	48·2	100	10	·05	S.
14	·52	50·2	41·8	48·1	48·2	100	10	·29	S.
15	·39	51·9	43·2	48·1	47·1	92	6	.02	S.
16	·57	49·9	39·2	45·9	45·7	99	10	·04	S.
17	·39	50·2	44·2	49·4	48·8	96	10	·15	S.
18	29·64	55·1	31·3	38·9	38·1	93	10	·05	S.W.
19	30·09	46·2	34·3	41·5	41·4	99	10	·17	S.
20	·17	49·1	40·9	46·4	46·4	100	10	·04	S.
21	·30	50·2	45·3	47·5	47·5	100	10	trace	S.
22	·24	44·1	42·2	42·4	42·4	100	10		S.E.
23	·16	40·2	32·3	39·4	39·1	97	10		S.E.
24	30·00	47·9	34·8	36·1	35·3	93	10		S.E.
25	29·97	40·7	34·8	37·9	36·8	90	10		S.W.
26	·97	37·8	34·3	35·8	34·5	88	10		N.W.
27	·83	33·9	30·8	31·4	30·3	84	10	·04	N.E.
28	·87	28·1	18·0	19·3	19·1	93	3	·25	N.
29	29·65	22·9	18·5	21·9	21·7	94	10	·37	N.E.
30	30·16	38·2	7·8	14·4	14·1	88	10	·09	N.
31	30·34	43·1	13·6	37·1	37·0	99	10	·04	N.
								Total	
Mean	29·88	45·0	34·0	39·6	39·1	95	8·9	2·64	
Mean for 26 years	29·92	42·6	32·0	37·4	36·4	88	7·9	2·26	

Total rainfall for the year, 24·80 in.

Mean for 26 years, 25·04 in.

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PHOTOGRAPHIC SECTION.

1908.

BALANCE SHEET.

RECEIPTS.

	£	s.	d.
Balance	15	0	0
Lent Term—Entrance Fees ...		15	0
Subscriptions ...		19	0
Easter Term—Entrance Fees ...	2	16	0
Subscriptions ...	3	15	0
Michaelmas Term—Entrance Fees		8	0
Subscriptions	1	7	0
	£25	0	0

EXPENDITURE.

	£	s.	d.
Lent Term—			
Ifould, Work and Cleaning ...		15	0
Knight, Hypo		7	0
Attride, Lamps		6	6
Easter Term—			
Ifould, Work and Cleaning ...	1	2	0
Knight, Hypo		17	6
Michaelmas Term—			
Ifould, Work and Cleaning ...		9	0
Knight, Hypo		5	3
Two Electric Bulbs		2	0
Balance in hand	20	15	9
	£25	0	0

G. E. BLUNDELL.

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THE MUSEUM.

One result of the opening of the New Hall has been to render a part of Great School available for a Natural History Museum. A partition with folding doors has been placed across the old room and the western portion, about two thirds of the whole, has been placed at the disposal of the Curator. A generous provision was made by the Governours for Cases and Tables, and a grant from the School Shop, to supplement the accumulated balance in the hands of the Natural Science Society, has enabled a considerable number of specimens to be purchased to add to the collection in the old Museum.

On examination it was found that several of the cases of birds which were presented five years ago by A. Crawshay, Esq., (O.W.) had suffered from damp and moth during the eighteen months they had been stowed away. These have now been put in order and the unmounted skins, which had at various times been presented to the Society by Lieut.-Col. W. S. Cumming and others, have been set up by Mr. G. A. Topp, of Reading. A large number of new cases of birds and mammals have also been purchased from him. Altogether the collection now contains specimens of more than half the British Birds.

Mr. W. Barnes of Reading, who for many years has been a most energetic collector of local Birds' Eggs, Coleoptera and Hymenoptera, having been compelled by ill health to give up his favourite pursuit, the Museum has been able to avail itself of the opportunity of acquiring some of the best local collections in existence.

Mr. FitzGerald, before he left, presented his collection of British Land and Freshwater Shells; a few of the gaps in this have been filled up by Mr. Monckton, but there are still opportunities for any who would like to help to make the collection really complete.

Three of the table cases have been filled by Mr. A. H. Bastin, of Reading, with specimens illustrating Protective Mimicry in Insects, Warning Colouration and allied subjects.

Mounted skeletons of a Fish (Haddock), an Amphibian (Frog), and a Reptile (Monitor Lizard) have been purchased. These with the Bird (Fowl) and Mammal (Rabbit), mounted for the Museum several years ago by the Rev. J. S. Tucker, make a set of typical vertebrate skeletons.

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It is hoped that the Museum may ultimately be fairly illustrative of the Natural History of the British Isles, foreign specimens being introduced only as types. Any donations from Old Wellingtonians or others which will help to realise this hope will be most gratefully received. Specimens of birds or eggs which are not already in the collection will be particularly welcome. A good example has been set by G. C. H. Crawshay, who, soon after the Museum was opened presented a mounted specimen of a Knot.

The Curator has to express his gratitude to Mr. Blundell and Mr. Eustace for a very large amount of help in the heavy work of arranging the specimens. Also to Mr. Wells who arranged the Lepidoptera whilst they were in the old Museum.

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MUSEUM EXPENDITURE.

	£	s.	d.
Topp, for repairs to Birds, &c.	12	8	6
Topp, for new Birds, &c.	111	15	0
Bastin, for cases illustrating Mimicry	31	10	0
Barnes, for Eggs and Cabinet	35	0	0
„ „ Coleoptera and Cabinet	16	0	0
„ „ Hymenoptera and Cabinet	18	0	0
Gerrard, for Skeletons	5	10	0
Crockett, for Cabinet	16	12	0
Hunt, for Mounts for Photographs	3	12	0
Ifould, for Enlarging and Mounting Photographs		12	6
Carriage of Birds, &c.	4	1	11
Trays and Labels		14	0
Books	1	1	2
Sundries		13	9
	£257	10	10

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FORTIETH ANNUAL REPORT

OF THE

Wellington College

NATURAL SCIENCE SOCIETY.

1909.

HEROUM FILII

"Τὰ γὰρ ἀόρατα αὐτοῦ ἀπὸ κτίσεως κόσμου τοῖς ποιήμασι νοούμενα καθορᾶται, ἥ τε ἀΐδιος αὐτοῦ δύναμις καὶ Θειότης."
Ἐπιστολὴ πρὸς Ῥωμαίους, I, 20.

WELLINGTON COLLEGE:
THOMAS HUNT.

1910.

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RULES.

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1. That this Society be called the "WELLINGTON COLLEGE NATURAL SCIENCE SOCIETY."

2. That the Society consist of Honorary Members, Corresponding Members, Members and Associates: the number of Members being limited to Fifteen.

3. That all Members of the School be eligible as Associates and that Members be chosen by the Committee from the Associates who are of at least one term's standing, and in the Upper School.

4. That Associates be proposed by a Member, Honorary Member, or Associate, seconded by one of the Committee and elected by the Members: their names with those of the Proposer and Seconder, having previously been entered in the Candidate Book, to be kept by the President.

5. That additional Members and Associates may be elected if the candidates have special qualifications, but that the number of Members thus elected do not exceed five.

6. That additional Members, elected by the provisions of Rule 5, need not be in the Upper School.

7. That the Society's Officers consist of a President, Vice-Presidents, Secretary and Treasurer.

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8. That the Officers of the Society and of the Sections, with the addition of two Members, who shall be elected at the first P.B.M. of every term, do form a Committee of management, and that in Meetings of the Committee, five be a quorum.

9. That the Secretary, and Treasurer, be elected annually at the last meeting of the Midsummer Term.

10. That the President and Vice-Presidents be elected from Honorary Members, and that a President on retiring become a Vice-President without election.

11. That the President or one of the Vice-Presidents take the chair at all Meetings, but that the Chairman have no vote except in cases of equality.

12. That the Secretary keep the Minutes of the Society's proceedings: a list of the existing Society, with the names and addresses, as far as possible, of all Honorary and Corresponding Members: and a list of all Benefactors of the Society; and that he produce the Minutes at the last Meeting in each term.

13. That the Treasurer look after the property of the Society, collect subscriptions, and pay debts; producing his accounts whenever called upon by the President to do so.

14. That in the absence of any officer, the Committee appoint a Deputy.

15. That Honorary Members and Corresponding Members have all the privileges of Members.

16. That Honorary Members pay a subscription of 1s. 6d. a term; or by payment of one guinea compound for future subscriptions.

17. That Members or Associates, on leaving the school, are entitled to become Corresponding Members. Other old Wellingtonians are eligible for election as Corresponding Members. Corresponding Members pay in advance a subscription of 6s., and receive in return the Society's Report for

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four years from the date of subscription; or by payment of one guinea compound for future subscriptions. It shall also be in the power of the Committee to elect as Corresponding Members, without any subscriptions, persons who have lectured before the Society, and other benefactors.

18. That Members and Associates pay a subscription of 1s. a term. No one may use the privileges of a Member or Associate until he has paid his subscription for the term.

19. That at every P.B.M. the list of Members and Associates who have not paid their subscriptions be read out by the President, and that at the last meeting of every term, those who have not yet paid be formally ejected by a vote of the Society. The reading of names may be dispensed with at the President's discretion.

20. That Members may speak and vote at all meetings of the Society; may read papers. with the leave of the President; and receive a copy of the Society's Report.

21. That Associates may speak at all Meetings; and may read papers with the leave of the President.

22. That Members and Associates provide with tickets the visitors whom they introduce at any Meeting, and that no visitors, except those who accompany Honorary Members, be admitted to any Meeting of the Society without such ticket; but in special cases the Committee be empowered to issue extra tickets.

N.B.—This rule is only to be enforced when the President thinks fit.

23. That Prefects may attend all Public Meetings without tickets.

24. That any Member or Associate may be suspended or expelled from the Society by a vote of two-thirds of the Members present, if he from any misdemeanour or want of energy, appear to deserve such suspension or expulsion.

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25. That meetings be ordinarily held once a fortnight, but thàt the Secretary be empowered to call Extraordinary Meetings when necessary.

26. That visitors may speak and read papers at all Public Meetings, with the leave of the President.

27. That all objects intended for exhibition at any of the Society's Meetings be submitted to the President at least two days before, and that they be accompanied on exhibition with a written description; further, that all exhibitions are to be made at the conclusion of the Paper or Lecture.

28. That the Editing Committee consist of the President, the Secretary, and one Member or Associate to be elected by the Society.

29. That a certain number of Officers be told off to collect the exhibitions.

30. That no change be made in these rules unless proposed by a Member or Honorary Member, and carried by a majority of the votes of the Members present at a subsequent Meeting.

31. That the sanction of the President be requisite for all motions relating to the expenditure of the Society.

32. That there be a Photographic Section, and an Arts Section, of the Society.

33. That the Officers of each Section consist of a Director and of a Secretary, who shall also be Treasurer of the Section.

34. That the Directors of the Sections be elected from the Honorary Members.

35. That each Section have the right of electing its own Officers and of making and altering its own bye-laws, provided that nothing is enacted which conflicts with the rules of the Society.

36. That the funds of the Society be chargeable with debts incurred by the Photographic Section to an amount not exceeding in any one year the sum of one shilling per term for each Member of the Section.

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List of the Society during the past year.

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G. E. BLUNDELL, Esq.

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Those Members and Associates whose names are marked *p* are members also of the Photographic Section.

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p A. F. S. NAPIER†
A. C. SYKES†

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R. A. SCOTT
R. A. D. McCULLOCH
C. V. J. BORTON
C. H. DAVIES

* Left Lent Term, 1909. † Left Easter Term, 1909. ‡ Left Christmas Term, 1909.

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List of the Societies to whom Copies of the Report are sent.

—:o:—

*Ashmolean N.H.S.
*Cheltenham College N.H.S.
*Christ's Hospital N.H.S.
Clifton College N.H.S.
*Dulwich College N.H.S.
*Epsom College N.H.S.
*Felsted School N.H.S.
*Haileybury College N.H.S.
*Harrow School Scientific Society.
King Edward's School, Birmingham, N.H.S.
*Malvern College N.H.S.
*Marlborough College N.H.S.
*Rugby School N.H.S.
*Uppingham School N.H.S.
Winchester College N.H.S.
British Museum (Natural History).
Geological Survey Office.
Linnean Society.
Royal Meteorological Society.
*U.S. Geological Survey Office.
*Chicago Academy of Sciences.
*El Instituo Geologico de Mexico.
*Cuerpo de Ingenieros De Minas del Perú.
*University of Montana.
*Wisconin Academy of Sciences, Arts and Letters.

* Those marked with an asterisk exchange reports with us.

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ACCOUNTS.

RECEIPTS.

	£	s.	d.
Balance in hand	23	4	8
Subscriptions :—			
Lent Term—Honorary Members ..	1	10	0
Members and Associates	6	7	0
Easter Term—Honorary Members		3	0
Members and Associates	7	11	0
Michaelmas Term—Honorary Members		3	0
Members and Associates	6	2	0
Sale of Report	11	1	8
Interest on Deposit	1	9	2
College Shop for Museum	100	0	0
	£157	11	6

EXPENDITURE.

	£	s.	d.
Gas and Limes for Lectures ...		5	10
Leitz for Electric Lamp	3	4	0
Hire and Purchase of Slides	2	0	6
Stamps	1	3	9
Carriage of Parcels		7	10
Hook for reading Thermometers ...	2	0	0
Cutting grass round Meteorological Instruments		1	0
Natural History Prize	1	0	0
Hunt for Printing Report	14	10	6
Museum	77	19	6
Balance in hand	54	18	7
	£157	11	6

Examined and found correct,

December 20th, 1909. S. A. SAUNDER. H. R. LUPTON, *Treasurer.*

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MINUTES OF OPEN MEETINGS.

Saturday, February 13th.

V. S. Bryant, Esq., gave a lecture on "Cornish Tin Mines."

The lecturer said that the slides he was going to show were taken from the first negatives ever exposed within the bowels of the earth. The first was a section of the Dolcoath main lode, the biggest Cornish mine, which reached a depth of half-a-mile. This mine was originally opened as a copper mine, and when the lode of copper had been mostly removed, an extremely rich lode of tin was found lower down; up to the present date ten million pounds sterling worth of tin had been excavated.

The next mine to this was Cook's Kitchen mine, so called from the fact that a miner named Cook, wishing to give his hearers an idea of the enormous width of the lode said it was as wide as his kitchen! A view of the surface and surface machinery above the East Pool mine was next shown, and also the Blue Hills mine.

A great number of metals had been found in conjunction with tin, the commonest of which were Copper, Lead, Bismuth, and among the rarer ones Tungsten, Uranium, and in very small quantities indeed Indium and Gallium, and in the last few months ores containing Radium and other radio-active elements.

The old methods of raising and lowering miners were next shown. The lode was generally inclined at an angle of forty-five degrees, so a beam several hundred feet long was sunk at this angle and at equal distances on it were placed horizontal platforms on which miners could stand; this beam moved up and down and a miner could travel at the rate of sixty feet per minute. This rod was counterbalanced by means of a balance box. The modern method of ascent and descent is by means of a gig running on four wheels between four guide rails; it is not very big but as many as eight men sometimes manage to get inside. It travels at a great rate.

Hammering in a crowbar to make a hole to put dynamite in for blasting purposes is known as "stoping"; there are

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two kinds of stoping, overhand when the crowbar is above the height of the elbow, and underhand when it is below the height of the elbow. It is most difficult when the crowbar is at the height of the elbow.

Two men stoping and one holding the crowbar can pierce twelve inches of rock in six or seven minutes. Machines for boring are also used, the Cornish Rock Drill being driven by compressed air supplied by mains from a compressing engine on the surface.

The galleries have practically always to be supported by timber; this is known as baulking. In treacherous ground, especially in the Dolcoath mine, although there seems to be a maze of timber, the roof and walls sometimes fall in, often with fatal results. The ventilation has also to be looked after. Everything is always of a very temporary nature in a mine.

Specimens of stone containing tin were next shown on the screen. When two lodes or veins cross and one slips down it is called a fault. "Slickensides" or polished stones are caused by a subsidence of a mass of stone rubbing on the mass directly beneath it. The tin is sometimes crystalline and sometimes runs in veins; a man who "knaws tin" means a clever, sharp man, as tin is very often hard to recognise.

The galleries widen out near a shaft and as it is cooler here the miners congregate to have their "croust," otherwise their lunch.

The ore is sent to the surface and crushed and separated from the rock by gravitational methods. The tin ore, containing oxide of tin, is placed on a slope and the lighter but useless rock is washed away. The Ore mainly goes to South Wales to be smelted.

The top of a shaft is very much like that of a coal mine. Slides of this and the machinery employed were next shown. Powerful engines have to be employed in pumping out the water from the bottom of the mine; large mains have to be used or the mine would be soon flooded. Water from the bottom of a mine is always steaming hot

Great difficulty was experienced in taking the photographs; oxygen and hydrogen cylinders having to be carried down the mines. Lime light, magnesium flashes and ribbon had also to be burnt. Difficulty was also experienced in finding a good lens.

The lecturer concluded by saying that he hoped the lecture had been rendered less dull by his friend's excellent photographs.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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Saturday, February 27th.

A. W. ANDREWS, ESQ., F.R.G.S., gave a lecture on the "Hill Towns of Italy."

The lecturer commenced by saying that some years ago his mother was occupied in writing a book on that illustrious Italian, Dante Alighiere, the Florentine poet. Wishing to make some of her descriptions of famous places more real, she entrusted him with the task of illustrating her work by photographs of Italian towns, especially those which "like an eagle's nest, hang on the crest of purple Apennine."

After this short introduction, the lecturer commenced his subject. After passing through that famous feat of modern engineering—the Mont Cenis tunnel—Turin is the first town of any importance that is reached. This town contains many specimens of quaint architectural style, but unfortunately all but a small portion has been modernised. From here the lecturer passed quickly through Genoa to the curious old town of Sarzana, which contains no specimens of modern buildings at all. Close to Sarzana is the ruined town of Luna, of which only the thicker walls of the amphitheatre now stand. Not far on is Lucca. There are many picturesque churches. The lecturer then passed on to Pisa, famous for the leaning tower, which, being made of pure white marble, is very glaring and trying for the eyes, under the bright Italian sun. After Pisa, the next town reached is Siena, which has been rather less modernised than most Italian towns. The cathedral is very beautiful. Under the pulpit are four stone lions, and during the service, and even during the sermon, the children come in and play round them, riding on their backs and playing hide and seek, but nobody seems to mind and they are allowed to go their own happy way unmolested.

The next few slides consisted of views of Florence, famous for its colonades and the Uffizi gallery, in which there is a wonderful statue of Dante, by Michael Angelo, in white marble. The famous Ponte Vecchio gives an idea of what Old London Bridge must have looked like before the great fire, when it had shops and houses along each side of it. It is very narrow and there is hardly room for two carriages to pass.

Not far from Florence is a very old town, San Gimignano, which was built in the thirteenth century and is absolutely unspoilt by any buildings of modern architecture. A slide was also shown of the house of Petrarch in Arezzo, which is now used as a military barracks. Poppi and Arezzo are two typical specimens of hill towns on the summit of steep rocky hills rising up at the foot of the Apennines.

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At one of the towns in the Casentino the lecturer saw a very curious funeral procession. The mayor had died and the whole town with all the schools had turned out for the occasion. The brothers of the Society of Misericordia, carrying long lighted candles, draped and masked entirely in black, were in the procession. From this town the lecturer started at 6 a.m. to climb Mt. Falterona from which in clear weather the sea can be seen on both sides; but even this early hour was late for such an attempt, and everything was hidden in mist when the summit was reached.

The lecturer concluded by saying that on the Apennines the scenery was rather monotonous, as most of the forests have been carelessly and indiscriminately burnt down. This makes the mountains very bare, but nevertheless, one is generally not disappointed when they are seen for the first time.

A vote of thanks to the lecturer was proposed by Mr. Moore.

Saturday, March 13th.

H. W. Monckton, Esq., F.L.S., F.G.S. (O.W.) gave a lecture on the Geological History of the Dorset coast.

The lecturer began by saying that he wished to talk about one section of geological history only, and that he would not confine himself entirely to Dorset, as the strata he was about to discuss ran all through England emerging both on the Dorset and Yorkshire coasts. He would begin with Dorset. The first slide showed the cliffs at Pinhay Bay, near Lyme Regis, and was followed by a diagram showing the positions of the different strata. The cliffs in question were constructed of White Lias, Liassic shale, and clay beds. Of these the White Lias contained shells such as one finds in the Caspian Sea, showing the probable presence of an inland sea; the Shale contained fossilised sea shells showing the advent of the open sea. The next two slides consisted of another cliff face and its diagram; in this case the clayey beds were very thick and had various properties which pointed to the fact that England was at the time under a fairly deep sea. The next few slides were views of the cliffs in the vicinity of Whitby consisting of Upper and Middle Lias. The beds above the Lias pointed to the presence of shallow seas, showing change from sea to land, or at least to fresh water, at that period. Returning to the South the lecturer showed some good examples of faulting, and then went on to compare the Bridport Sands with those found on the Yorkshire coast. These beds above the Lias are a fruitful source of disagree-

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ment to geologists. It is probable that at some part the sea receded and left estuaries and rivers; this would account for the "current bedding" and plant fossils in Yorkshire and the Midlands. More slides of the Yorkshire coast were shown, demonstrating the manner in which, in Oxford Clay times, the sea gradually submerged the land to a considerable depth. Returning to the Isle of Purbeck on the Dorset coast some ammonites of this period were shown. Those of the shallower sea periods had time to fill with sand and mud, before becoming buried on the bottom, and have been able to resist the subsequent pressure under which the empty ones of the deeper or more muddy seas collapsed. Proceeding along the coast signs of shallower seas may be seen, as in the Portland stone, of which several good slides were given, and in the oyster beds which can be seen just above it in Durlston bay and Tilly Whim caves. Durlston bay also shows fossils indicating land or lagoons, and contains one narrow layer of rock with fossil mammals in it. These mammals were something of the kangaroo type. If it were not for this bed it would probably not be known that England contained mammals at so early a period. In the upper stone beds crocodile remains are found. Proceeding up the cliffs the next thing noticeable is the Purbeck marble, which consists entirely of land shells. Chalk follows and after it we get freshwater beds as at Reading. The lecturer concluded with some slides representing the sand and pebble beds, similar to those at Bagshot and in the neighbourhood of the College, so completing the period which he had selected to talk about.

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

Saturday, May 15th.

Sir Edmund Cox gave a lecture on the "British Navy."

The lecturer commenced by showing a slide of Henry VIII, he said he would have liked to have had one of Alfred the Great, as he was the real founder of our Navy. Henry VIII was however the earliest of the English kings who took an interest in the navy of whom he could procure a slide.

The next reign in which the navy was conspicuous was that of Elizabeth. It was under her that so many great sailors lived, such as Sir Francis Drake, who circumnavigated the globe, and Sir Walter Raleigh, who introduced potatoes and tobacco. The spirit of the age was well shown at the historic game of bowls on Plymouth Hoe. After showing a

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slide of this game, the lecturer went on to say that the difference between the English and Spanish fleets was not so great as had been made out. Some of the English ships were quite large and all were much better armed and manned for their size than the great Spanish galleons. But the advantage England possessed was the good training of her seamen, and even more important the spirit which animated them.

The Stuarts, who succeeded the Tudors, were always too poor to do anything for the navy, for it must be remembered that in those days the king paid for the army and the navy out of his own income. It was only during Cromwell's spell of power that England distinguished herself on the high seas. Then it was that Robert Blake, a former leader of cavalry, took to the sea and fought those terrible battles with the Dutch. After a victory their admiral, Van Tromp, had sailed down the channel with a broom at his masthead; but the next spring Blake appeared with a whip at his, and once off the North Foreland, and again off the coast of Holland, he whipped the Dutch fleets off the seas, killing Van Tromp in the latter fight. This whip was the origin of the pennants that are so often to be seen floating from the masts of British warships.

The Dutch did not fight us again until the days of Charles II, but when they did, they put England into one of the most shameful positions she has ever been in, and all because she was unprepared. The guns of their fleet could be heard at London, and yet Charles did not do anything. The Commanders of the navy at the time were Monk and Prince Rupert, gallant enough cavalry leaders, but wholly unable to manage a fleet.

A century later England was again in a parlous condition, the navy was in mutiny, and war was declared with Holland, France and Spain. Luckily the sailors were granted redress of several grievances; and a few weeks after, they were led forth to victory, at Camperdown under Admiral Duncan, and at St. Vincent under Admiral Jervis, ably seconded by Nelson, as yet only a Lieutenant.

A few years later, Nelson won the battle of Aboukir Bay, and then under Sir Hyde Parker, but contrary to his orders, he sailed into Copenhagen and sunk nearly the whole Dutch fleet. Still Napoleon schemed an invasion of England; and it was only after the blind chase across the Atlantic, that Nelson, through the help of Calder, came up with the combined French and Spanish fleets. He defeated them with a considerably inferior force at the great battle of Trafalgar. That battle marks the zenith of England's sea power, but it was marred by the death of the noble hero who won it. The

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famous signal sent by Nelson to the fleet before the battle, "England expects every man to do his duty," was originally meant to be "Nelson confides that every man will do his duty," only one of his officers dared to suggest that "England" would be better than "Nelson," so the change was made; then as there was no word in the code for "confides," "expects" was substituted for it.

The lecturer concluded with a few slides of some of England's greatest admirals, including Lord Charles Beresford, who was greatly cheered; this the lecturer said he was very pleased to hear. There were also some slides of the "Dreadnoughts," about which the lecturer said he was sorry not to be able to give more information than he did. The last slide was of His Majesty the King, whose appearance on the screen was also greeted with cheering.

A vote of thanks to the lecturer was proposed by Mr. FoxStrangways.

Saturday, May 29th.

W. H. WAGSTAFF, ESQ., gave a lecture on the "Rainbow."

The lecturer commenced by saying that it gave him great pleasure to come back to Wellington, where several years ago he had been one of the Masters; and that although great changes had taken place, there still remained a few of his old colleagues. He then went on to show how light was reflected and refracted. By means of a diagram he explained what happened in a single drop of rain when the light fell upon it. Some of the light was immediately lost by reflection, while some was refracted, internally reflected and then refracted again on emerging until it finally reached the eye. He then shewed how the secondary rainbow was formed, by two internal reflections. The same thing happens for each ray of light which strikes a raindrop, and as different colours are differently refracted the light is split up into its components; but there is one direction in which a preponderance of red light is sent, another in which orange predominates and so on: hence it is that we get the colours seen in the Rainbow. The lecturer continuing, shewed how to ascertain the position of the rainbow before it is actually visible. To do this you place your back to the sun and look along the line in which the rays of light are coming from the sun, then raise your head through an angle of 42° and you will see the rainbow. A third bow cannot be seen because it is formed in a part of the sky close to the sun.

A vote of thanks to the lecturer was proposed by Mr. Brown.

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Saturday, June 12th.

DR. A. SMITH WOODWARD, F.R.S., gave a lecture on "Fossil Reptiles."

A vote of thanks to the lecturer was proposed by Mr. H. W. Monckton.

Saturday, July 10th.

H. R. LUPTON read his Essay on the "Geology of the London Clay round Wellington College," for which the Pender Prize had been awarded to him.

"The object of this paper is to bring before the Society the diversity of the fossil remains in the London Clay formation around Wellington College. The accompanying map shews roughly the positions of the four pits from which I have obtained most of my specimens. The actual names of only two of the pits are known to me; viz., Down Mill Pit, Bracknell, and Fish Pond Pit, Wokingham. The other two I have called respectively the Bracknell Selenite Pit, (owing to the occurrence there of crystals of Selenite in the Clay), and the Bracknell Gastropod Pit, (owing to the presence in some of the septarian boulders of numerous gastropods).

It will be seen from the map that the Gastropod Pit is much further from the College than any of the others, and it has consequently been less visited. Thus its yield of fossils is probably underestimated.

The Down Mill Pit, Bracknell. This pit has been known to me longer than the others, and consequently its yield of fossils is great, the number of species obtained from it being 48. The cliff-section is a very simple one, for, on referring to the above map we find the Down Mill Pit on the London Clay, so that there is no complication of Bagshot series occurring near near the surface. At the top of the pit there is a layer of clay and pebbles attaining a depth of not more than about two feet. This is only a surface-bed. Below this, but without any distinct division from it, extends the brown clay, the bottom of which is about 26 feet from the surface. The upper part of this brown clay is not so homogeneous as the lower, but is mottled here and there with greyish green streaks. Also, most of the Septaria, or nodules, occur in the lower part of this brown clay. Below the brown clay, *i.e.* 26 feet down is the true "blue" London Clay, which is really greenish black in colour. In the Down Mill Pit there are no septaria or nodules in the blue clay, but there are many remains of shells, which fall to pieces when touched. At one time the level of the bottom of this pit had to be raised to avoid a layer of shells, which were so numerous as to spoil the bricks. The pit is still worked at the raised level. A section is shewn below.

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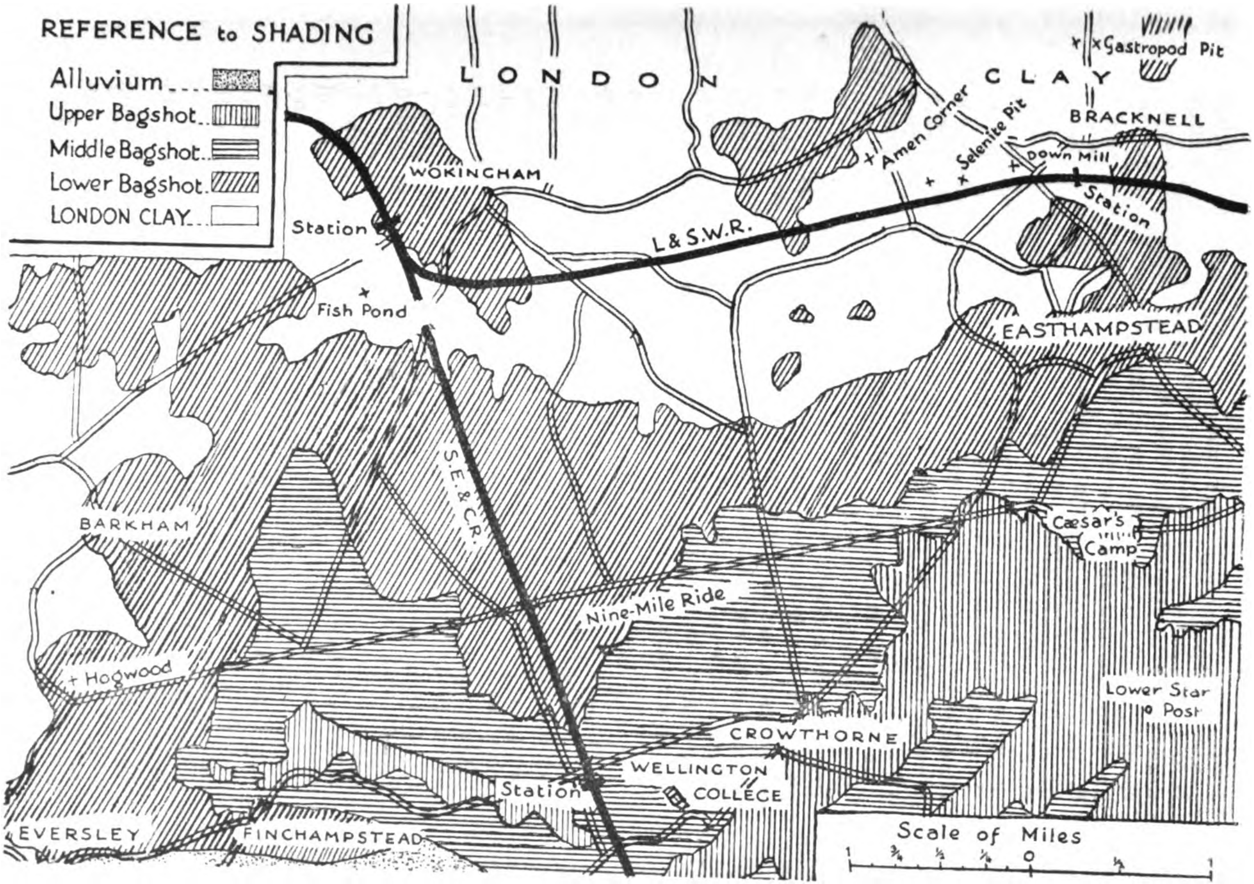

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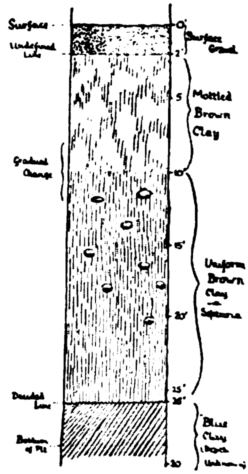
The above section runs roughly N.W. and S.E., but if a section were taken at the Down Mill Pit running at right angles to this, the line between the blue clay and the brown would have a slope of about 6°. This is approximately equal to the slope of the surface in this direction, and it seems possible, therefore, that all the clay may once have been black, but that the atmosphere and the weather have effected a change on the colouring matter of the clay down to this depth. Probably the ferrous salts which colour the greenish-black clay are changed to the brown ferric salts by the action of the atmosphere, should they be at a depth of less than about five-and-twenty feet. There is no brown clay at Wokingham where the clay is protected from the atmosphere by the Bagshot series.



CLIFF SECTION AT DOWN MILL. BRACKNELL.

It was mentioned that the surface of the section of the Down Mill Pit from N.E. to S.W. sloped fairly steeply. The pit is thus situated at the side of a hill, and the clay has not therefore to be lifted out of the pit, but is drawn in trucks along the level to the kilns lower down the hill. The bricks when made have, however, to be lifted up to the railway-level.

On account of the raising of the working-level of this pit to avoid the fossils, these are much scarcer than they used to be, and the boulders containing gastropods seem to have greatly diminished. Also the shells which occur in the clay, (which have to be thick in order to resist decomposition) are no longer excavated. Thus such shells as the Nautili, of which the men used to find many specimens, are but rarely found now. The blue clay is, however full of remnants of many small shells, chiefly Modiola, or mussel-shells; these, however are all powdery or break when touched. There is a rather harder bed of such modiola, many filled with Iron Pyrites, but nearly all broken, on the floor of the present level. It is also chiefly in the blue clay that sharks' teeth occur, though this is not always the case even in this pit.

The nodules in this pit seem to be scattered about, chiefly in the lower part of the brown clay (see section). They are of several sorts, and may perhaps be conveniently divided as follows: First, there are rounded, and usually more or less symmetrical, nodules. These when struck either break

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radially or into layers,—concentrically, so to speak. The surface of the radial fractures is generally of a dark-green velvety appearance, but this is usually streaked with yellow; sometimes the whole appearance gives the idea of brown velvet. When the nodules break parallel to their surface they often expose the brown velvety appearance, and sometimes a black substance resembling burnt paper, which quickly crumbles up, is found. Often these nodules break where there was no symmetrical fracture, when they may expose a colony of Ditrupa, generally with a few small gastropods. The substance which gives the velvety appearance to the boulders is Gypsum, which crystallizes round the nodule, the ends of the tiny crystals alone being seen. The crystals are generally about $\frac{1}{8}$-in. long, forming a layer of that thickness round the nodule. These nodules are not often very productive of fossils.

Secondly there are the dark grey nodules, which are very hard and usually larger than those above-mentioned. These concretions, which serve to preserve most of the fossils, often contain nothing but modiola, but sometimes they are full of all sorts of mollusca, and frequently have as a nucleus a piece of timber. Some of these are composed of bleached wood, surrounded by a layer of hard calcareous rock, in which are myriads of remains of ostrea, which are almost inextricable in a perfect condition. The shells are often filled with Sulphate of Lime, which hardens them, and facilitates their removal. If not full the surface of the Gypsum presents the same velvety appearance as in the septarian nodules mentioned above. Another substance frequently present is iron pyrites, some of the shells being buried in it. The varying oxides of iron present with the pyrites often tint the crystals with irridescent shades of blue and green.

Thirdly there are nodules which are composed of an argillaceous substance harder than the clay itself, which, however becomes soft on exposure to the atmosphere. These usually contain Vermetus, and often Modiola, but few other molluscs.

I have described these Septarian nodules at some length, because the same description applies to those of the other pits. It will be understood, therefore, what is meant by "nodules of the first, second, or third class," when speaking of other pits.

These septarian nodules are very dangerous to the men who work in the pit, as they are loosened by vibration or undermining, and are liable to fall unexpectedly. The regular plan of working is to undermine the cliff at the bottom, and afterwards to bring down the clay from above with a crowbar. Men have also been killed by unexpected falls of clay, which

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are brought about chiefly by the softening effect of the rain. I have seen such falls of clay even on Saturday afternoons when there is no vibration whatever.

The clay in this pit is very soft in winter,—so soft that in the months of November, December, and January, it is not worked, the close time, of course, varying with the weather. In summer it is sometimes so hard that a hose is continually kept running on it to make it workable. It is the possibility of hardening the clay that renders possible the preservation of the fossils from the clay.

The Selenite Pit, Bracknell. As before mentioned, this pit is only provisionally called "The Selenite Pit" on account of the occurrence of crystals of Selenite both in the black and brown clays. These usually radiate from a centre, giving a flower-like appearance. The workmen there called the crystals "petrified water," but they readily took to the idea of their being selenite. The crystals are usually imperfect, but when perfect they seem to be prisms of hexagonal section as shewn :

As near as I could measure with the imperfect crystals at my disposal, the length of long side: length of short side = 1·76. Also the end angles are each 105°. My best crystals were about an inch and a half in length. Analysis shews that these crystals contain also some compound of strontium.

The cliff-section does not materially differ from that at Down Mill, though the division between the brown and black clays is perhaps more marked.

In this pit there seem to be very few of the hard calcareous nodules containing gastropods, though there are many containing wood, and many of the first type, yielding few fossils. There are, however, many Cyprina planata scattered throughout the clay, mostly crumbling, although the casts are often complete. None of these have been obtained from the Down Mill Pit, although it is so near. Like the Down Mill Pit, this pit is situated on the side of a hill, but its depth at the deepest place is somewhat less than that of Down Mill.

The Gastropod Pit, Bracknell. On reference to the map on page 21, it will be seen that the Gastropod Pit lies on the Lower Bagshot series, the London Clay underlying it. There is therefore a bed about 12 feet thick of yellow pebbles and sands at the top of the pit. On again referring to the map it will be noticed that the pit is situated at some distance from a railway. This is the oldest Bracknell Pit, the railway being constructed after the Pit. Consequently the latter was deserted some years ago and is now overgrown, the lowest part being covered with water. Thus no good cliff-section can be obtained, and no black clay is now visible. The nodules are mostly buried, but are of all three sorts, those of the second

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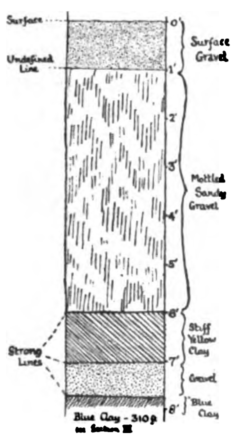
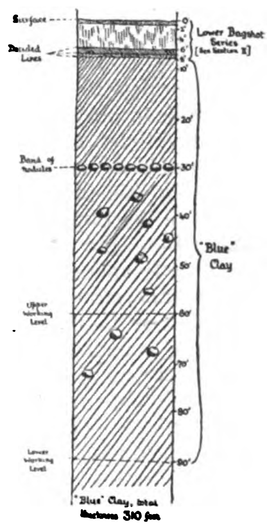
class being exceptionally rich in fossil remains. A workman at the Selenite Pit, who was employed on the Gastropod Pit, told the writer that they used to find many fossils there, including nautili. The part of the pit at the other side of the road contains fewer nodules. It is also partly filled with water. The depth of the water not being known, the exact depth of the pit could not be ascertained, but it was about forty or fifty feet.

The Fish Pond Pit, Wokingham. This pit is much deeper than any at Bracknell, being nearly 100 feet deep on the lowest working-level, and 110 feet at the bottom of the hole which collects the water to be pumped up in the wet-season. There is a band of the lower Bagshot series about seven or eight feet thick at the top. This band is worked for gravel. It consists of about a foot of surface gravel, below this about five feet of sandy gravel in layers and mottled yellow and green. Below this is a band of yellow tenacious clay, finer than the London clay, just under 12 inches in thickness, then a few inches of gravel separating it from the blue clay.



LOWER BAGSHOT AT FISH POND.



SECTION AT FISH POND, WOKINGHAM.

About thirty feet below the surface there is a band of nodules, there being few or no stray nodules in the blue clay above this band though there are some below. The upper working-level is about 60 feet from the surface.

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About 30 feet below this is the bottom level of the pit, nearly 100 feet below the surface. Many shells occur in this lowest blue clay, mostly not quite so crumbly as at Bracknell.

The fact that there is no brown London Clay at Wokingham seems to confirm the idea that the blue clay in the course of ages is turned brown from above, for where the blue clay is protected above by Bagshot sands and clay, no oxidising effect is produced.

A boring at the Fish Pond Pit shewed that the thickness of the London clay there is 310 feet, underlaid by chalk.

The method of working is somewhat different from that at Bracknell. At the lowest level, a short tunnel is made in the clay, the roof being supported by beams. A truck is then pushed half into this tunnel, and the clay, loosened above with a crowbar, rolls into the truck. When full the truck is hauled up to the kilns by steam-power. On the upper level the clay is brought down in the same way, having been previously undermined. The cliff being almost vertical, it is then loaded into the trucks. The man who is bringing down the clay cuts steps in the cliff-face and stands half-way up the cliff.

This pit is at present by far the most productive of fossils. Some are chipped from the nodules, (of which the writer has only seen the first two kinds), thrown up at the pit-head, but many have been obtained from the clay by a workman.

When dry these shells from the clay become quite hard, and if varnished the effect of damp in the atmosphere is obviated. In this pit sharks' teeth seem to occur at almost every level of the blue clay.

In describing the fossils I have given nearly every one a name, chiefly in order to be able to mention them quickly. It must be understood however, that although the specimens are named, the names are mostly provisional, the specific names being especially doubtful. The classification of the molluscs is as nearly as possible that of Sowerby.

The specimens in the present collection represent the following orders: (1) Chelonia (part of turtle), (2) Pisces (sharks' teeth, palate, etc.), (3) Mollusca, (4) Radiata (part of test of sea-urchin), (5) Vermes (Ditrupa, serpula, etc.), (6) Plantæ (Wood, resin).

Pisces. These are represented by their teeth (the hard enamel of which has preserved them from decomposition) and part of a palate of ætobatis.

(*a*) Otodus obliquus. Length 1¾ inches, Width 1¼ inches, Down Mill and Fish Pond.

(*b*) Odontaspis elegans. Length about 1 inch, Long and narrow.

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(c) Lamna sp. Distinguished from (b) by the absence of ridges near the base of the tooth; similar in shape and size.

(d) Lamna macrota. Similar in size to the last, but curved over to one side and rather broader.

(e) Ætobatis sp. Part of the palate, which consists of a number of layers with fluted joints.

None of these teeth have been found in the septarian nodules: they are scattered about the clay and are found and kept by the workmen. One specimen of Odontaspis elegans is white, owing to the fact that the fangs were broken off before fossilization, the pigment being thus allowed to escape.

Chelonia. This order is represented by numerous fragments of the test of a turtle, which was found at Bracknell. Unfortunately the specimen is not complete, two large pieces having been given away before the writer saw them. The total length of the test must have been about 15 inches, from the accounts of the men. The specimen was found at Down Mill, at a depth of about 24 feet.

Mollusca. These are represented by 45 species of gastropods, 24 of bivalves, and 1 of Bryozoa. They are probably all marine, though there are one or two circumstances which point to their having lived not far from land. The species are as follows:

(a) *Nautilus Imperialis.* About 9 inches in diameter, this species is best represented by the inside whorls of the shell, preserved in an almost perfect state by the outer whorls. At Down Mill this species used to be found in comparatively large numbers just below the present working-level. At Fish Pond the specimens were found at a depth of about 50 feet. None have been found in the septarian nodules.

(b) *Cypræa Bowerbanki.* Found in the brown clay at Down Mill.

(c) *Cypræa oviformis.* Found in a nodule of the second class at the Gastropod Pit, and also in a fine state of preservation in the clay at Fish Pond.

(d) *Voluta scabricula.* From second-class nodule at Down Mill.

(e) *Voluta sp.* From second-class nodule, Gastropod Pit.

(f) *Mitra sp.* From second-class nodule, Fish Pond.

(g) *Buccinum lavatum.* From second-class nodule, Gastropod Pit.

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(*h*) *Buccinum sp.* From clay at Fish Pond and second-class nodules at Fish Pond and all three Bracknell Pits. This species closely resembles Fusus regularis, but is stouter in comparison to its length. The spur also at the mouth is shorter in Buccinum than in Fusus.

(*i*) *Cassis ambigua.* From clay at Fish Pond, much straighter in profile than Cassidaria.

(*j*) *Cassidaria coronata.* From nodules of second-class at Down Mill, the Gastropod Pit and Fish Pond: also from the clay at Fish Pond. This species is distinguished from the next by its greater length in comparison to its breadth, the spur also being longer. Otherwise the two species closely resemble one another.

(*k*) *Cassidaria nodosa.* From clay at Fish Pond, and nodule of second-class at Gastropod Pit.

(*l*) *Cassidaria striata* and *vars.* (4) and (5). Second-class nodules at Down Mill and Gastropod Pit; clay at Fish Pond. C. striata is somewhat similar in shape to C. coronata, but has no tubercles. Vars. (4) and (5) may be young Cassidariæ or young Pyrulæ. It is, however, very difficult to identify them.

(*m*) *Rostellaria rimosa.* Found in second-class nodule at Selenite Pit, and also in great numbers in clayey nodules at Hook.

(*n*) *Rostellaria sp.* Found in clay at Hook.

(*o*) *Rostellaria lucida.* Found in second-class nodule at Fish Pond.

(*p*) *Aporrhais sp.* From second-class nodule at Down Mill.

(*q*) *Triton fasciatus.* From clay and second-class nodule at Fish Pond.

(*r*) *Murex defossus.* From clay at Fish Pond.

(*s*) *Murex sp.* From second-class nodule at Gastropod Pit.

(*t*) *Pyrula angulata.* From second-class nodule, Down Mill. This specimen might be a young individual of the genus Cassidaria.

(*u*) *Pyrula Smithii.* From clay at Fish Pond and second-class nodule, Hook. (?)

(*v*) *Fusus regularis.* From second-class nodules, Down Mill, Gastropod Pit and Fish Pond. At first confused with Buccinum sp. (*h*).

(*w*) *Fusus cymatodis.* Second-class nodules, Down Mill and Fish Pond.

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(*x*) *Fusus porrectus.* From Down Mill, second-class nodule.

(*y*) *Fusus bifasciatus.* From second-class nodule, Down Mill.

(*z*) *Fusus curtus.* From nodule of third-class, Gastropod Pit.

(a_1) *Fasciolaria sp.* From second-class nodule at Gastropod Pit.

(b_1) *Pleurotoma Wetherellii.* From second-class nodule, Gastropod Pit.

(c_1) *Pleurotoma denticula.* From second-class nodules at Gastropod Pit and Fish Pond.

(d_1) *Pleurotoma Prestwichii.* Second-class nodule, Down Mill and clay at Fish Pond.

(e_1) *Pleurotoma sp.* From second-class nodule at Gastropod Pit.

(f_1) *Pleurotoma sp.* From second-class nodule, Down Mill.

(g_1) *Turritella sp.* A cast from the clay at Fish Pond.

(h_1) *Trochus sp.* From clay at Fish Pond.

(i_1) *Solarium bistriatum.* From nodules of second-class at Down Mill, Gastropod Pit and Fish Pond.

(j_1) *Scalaria lævis.* From second-class nodule, Fish Pond.

(k_1) *Natica Parisiensis.* From second-class nodules at Down Mill, Gastropod Pit and Fish Pond.

(l_1) *Natica epiglottina.* From second-class nodule, Fish Pond.

(m_1) *Natica Hantoniensis.* From second-class nodules at Down Mill and Gastropod Pit.

(n_1) *Natica ambulacrum.* From second-class nodules at Down Mill and Gastropod Pit.

(o_1) *Natica depressa.* From second-class nodule, Down Mill.

(p_1) *Paludina sp.* From clay at Fish Pond, this specimen in that Paludina is a fresh-water genus, shewing amongst other evidences that the London Clay strata were deposited not far from land. The identification is exceedingly uncertain.

(q_1) *Calyptræa sp.* From nodules of second-class at Gastropod Pit and Fish Pond.

(r_1) *Dentalium sp.* From nodules of second-class at Gastropod Pit and Fish Pond. Some specimens of this mollusc have peculiar organisms inside the shells, which have not yet been identified.

(s_1) *Unknown univalve.* From clay at Fish Pond, this univalve has the general form of Paludina, but the

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shell is thick, and the markings, which run longditudinally along the whorls, like those of the Common Periwinkle, are quite unlike those of any species of Paludina.

Of the Bivalves:

(*a*) *Ostrea flabellula.* From clay and second-class nodules at Down Mill and Fish Pond. Some of the specimens from Fish Pond are preserved almost perfect.

(*b*) *Pinna affinis.* From Down Mill and Gastropod Pits, in second-class nodules, has also been found at Fish Pond. Usually very fragmentary.

(*c*) *Modiola depressa.* From second-class nodules at Down Mill, from second-class nodules at the Gastropod and Selenite Pits, and from clay at Fish Pond. These shells often compose large masses of rock, and there is a bed of them at the present working level of the Down Mill Pit.

(*d*) *Modiola elegans.* From nodule of second-class at Down Mill.

(*e*) *Avicula sp.* From second-class nodules, Down Mill and Fish Pond.

(*f*) *Cardium nitens.* Very common in second-class nodules at Down Mill, Gastropod Pit and Fish Pond. Also common in the clay at Fish Pond.

(*g*) *Cardium semigranulatum.* Very common in second-class nodules at all Bracknell Pits and in clay and second-class nodules at Fish Pond.

(*h*) *Cytherea orbicularis.* From second-class nodule at Down Mill and from clay at Fish Pond. This and the six succeeding species seem to have been the especial prey of some carnivorous mollusc, probably Natica, which bored round holes in the shells and thus attacked the occupants from an indefensible quarter. The round holes are to be seen in many of the specimens.

(*i*) *Cytherea lucida.* From second-class nodule at Down Mill and from clay at Fish Pond.

(*j*) *Cytherea sp.* From second-class nodule at Down Mill.

(*k*) *Cyprina planata.* From clay and second-class nodules at Selenite Pit and from clay at Fish Pond and Hook. This, by far the largest species of bivalve in the collection, seems to have built its shell in very distinct layers, which come apart on decomposition. The shell is sometimes almost ¼ inch thick, but the species is most often represented merely by the cast.

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(*l*) *Cyprina Morissi.* From nodules of second-class at the Selenite Pit, and from clay and second-class nodules at Fish Pond.

(*m*) *Cyrena cuneiformis.* From second-class nodules at Down Mill and Fish Pond.

(*n*) *Cyrena tellinella.* From second-class nodules at Down Mill and Selenite Pit.

(*o*) *Astarte rugata.* From second-class nodule at Down Mill.

(*p*) *Astarte tenera.* From second-class nodule at Gastropod Pit.

(*q*) *Sanguinolaria sp.* From second-class nodules at Gastropod Pit.

(*r*) *Corbula globosa.* From second-class nodule at Down Mill.

(*s*) *Leda minima.* From second-class nodule at Fish Pond. Very gregarious.

(*t*) *Cultellus affinis.* From second-class nodule at Gastropod Pit. It will be noticed that both valves of this specimen are intact, although open. This shews that it must have been deposited not far from where it lived, and there cannot therefore have been much current in the sea in which the strata were laid down.

(*u*) *Panopæa intermedia.* From the clay at Down Mill.

(*v*) *Panopæa sp.* From second-class nodule at Down Mill.

(*w*) *Teredina personata.* From second-class nodules at all the Pits except Hook. This species is generally about ⅛ inch in diameter, making holes of that size in wood. These are frequently entirely or partly filled with Gypsum, so that, the wood decaying, casts of the boring alone remain. Specimens making holes more nearly ¼ inch across have been found at Down Mill.

Of the **Bryozoa** there is but one species, *Fenestella sp.*, found in second-class nodules at Down Mill, in the clay at Fish Pond, and in third-class nodules at Hook. At Hook especially it forms large sheets of surface, usually showing the individual cells on the one side, while on the other appears the ribbed structure of the colony.

Of the **Vermes** there are four species:

(*a*) *Serpula heptagona.* Found in nodules of second class at Down Mill and Fish Pond. As the names implies, this species is of heptagonal section, possessing seven longditudinal ridges on the outside. Note the presence in some specimens of the operculum *in situ.*

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(*b*) *Ditrupa plana.* This annelid occurs in vast quantities in second-class nodules at Down Mill. Very frequently there are no other fossils present with the Ditrupa.

(*c*) *Vermetus Bognoriensis.* From nodules of third-class at Down Mill and Gastropod Pit and also from clay at Fish Pond.

(*d*) *Unknown annelid.* Found in second-class nodules at Fish Pond, this annelid infests the oyster, living in a horn-shaped shell on the back of its host. The shell seems to consist of two distinct layers, joined at intervals by bridges of shell, the spaces having probably once been filled with some more perishable substance.

The great family of the **Radiata** are represented by:

(*a*) *Pentacrinus sp.* The specimen, which is very much crushed, was found in a nodule of the second-class at Down Mill.

(*b*) Part test of *Echinoderm.* Found in second-class nodule at Gastropod Pit.

The **Plantae** are represented by *wood* and *resin*, but none of the fruits or of the leaves have as yet been found. The wood often forms the nucleus of a nodule, in which case it is usually somewhat decayed, and generally bored by Teredina. The trunk of a tree was, however, found in the clay at Down Mill at a depth of about 35 feet. It was surrounded by a thin layer of greenish sand. The wood is generally blackened by its own carbonaceous matter. It has been found in all pits except Hook. Resin has been found at Down Mill and Fish Pond. It closely resembles sealing-wax except in colour, which is brown or black. That from Fish Pond seems liable to decompose on exposure to the atmosphere.

The nature of the fossils seems to point to an estuarinē deposition; the mollusca being marine, with one doubtful exception, while the remains of a turtle and of wood and resin show that land cannot have been far distant. Also on an ordinary sea-coast floating timber is not carried out to sea, but is thrown up by the tide on to the shore; thus the fact that the timber became water-logged and sank points to the existence of an outward current such as might be caused by a large river. This current cannot have been rapid, for many of the bivalve shells remain with both valves together though open: this could hardly have occurred in a heavy current, the valves in that case being inevitably dashed apart. Thus these strata were probably deposited not in the immediate neighbourhood of the mouth of the river, but some miles away

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from it. On the other hand the current was strong enough to pile the shells into heaps, as is shewn by the aggregations of shells which form the nodules, especially those of the second class.

In conclusion it may be well to point out that of the two minerals occurring in the strata whose composition is known, the origin of only one has been ascertained. The crystals of selenite are formed by the interaction of ferrous sulphate and bicarbonate of calcium, the latter of which is dispersed throughout the clay, and the former formed by the oxidation of the iron pyrites present in the clay. It is the varying oxides of iron produced by these reactions that colours the Iron Pyrites as mentioned above.

Such, then, briefly are the London Clay strata in the neighbourhood of Wellington College. There is field for almost endless investigation, especially in the microscopic branch of the subject. The specimens illustrating the present essay are to be found in the table-case in the College Museum."

The President congratulated Lupton on the excellent Essay which had just been read. He called attention to the amount of work which it represented, reminding the audience that the nearest of the pits he had visited was about five miles from the College and that Lupton had walked over to one or other of the pits nearly every half holiday, had explored the pit and collected the fossils. The Essay he had written was a really valuable contribution to the Geology of the neighbourhood and Lupton had presented to the College Museum the whole of the collection. For this most valuable gift he asked them to accord him a hearty vote of thanks.

The following table is a catalogue of the specimens :—

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LIST OF SPECIES OF FOSSILS FROM THE LONDON CLAY NEAR WELLINGTON COLLEGE.

Number		Down Mill	Gastropod Pit	Selenite Pit	Fish Pond	Hook.
	CHELONIA.					
	Bones of TURTLE	C				
	PISCES.					
1.	OTODUS obliquus	C			C	
2.	ODONTASPIS elegans	C			C	
	LAMNA sp.	C			C	
3.	LAMNA macrota	C			C	C
77.	ÆTOBATIS sp.				C	
	MOLLUSCA.					
4.	NAUTILUS Imperialis	C			C	
5.	CYPRÆA Bowerbanki	C				
6.	CYPRÆA oviformis		II		C	
7.	VOLUTA scabricula	II				
8.	VOLUTA sp.		II			
A.	MITRA sp.				II	
9.	BUCCINUM lavatum		II			
10.	BUCCINUM sp.	II	II	II	II C	
B.	CASSIS ambigua				C	
11.	CASSIDARIA coronata (var. 1)	II	II		II C	
12.	CASSIDARIA nodosa (var. 2)		II		C	
13.	CASSIDARIA striata (vars. 3, 4, 5)	II	II		C	
14.	ROSTELLARIA rimosa			II		III
15.	ROSTELLARIA sp.					C
D.	ROSTELLARIA lucida				II	
16.	APORRHAIS sp.	II				
17.	TRITON fasciatus				II C	
18.	MUREX defossus				C	
19.	MUREX sp.		II			
20.	PYRULA angulata	II				
E.	PYRULA Smithii				C	II
21.	FUSUS regularis	II	II		II	
22.	FUSUS cymatodis	II			II	
23.	FUSUS porrectus	II				
24.	FUSUS bifasciatus	II				
25.	FUSUS curtus		III			
26.	FASCIOLARIA sp.		II			
27.	PLEUROTOMA Wetherellii		II			
28.	PLEUROTOMA denticula		II		II	
29.	PLEUROTOMA Prestwichii	II			C	
30.	PLEUROTOMA sp.	II				
31.	PLEUROTOMA sp.		II			
32.	TURRITELLA sp. (cast)				C	
33.	TROCHUS sp.				C	
34.	SOLARIUM bistriatum	II	II		II	
35.	SCALARIA lævis				II	

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Number		Down Mill	Gastropod Pit	Selenite Pit	Fish Pond	Hook.
36.	NATICA Parisiensis	II	II		II	
37.	NATICA epiglottina				II	
38.	NATICA Hantoniensis	II	II			
39.	NATICA ambulacrum	II	II			
40.	NATICA depressa	II				
41.	PALUDINA sp.				C	
42.	CALYPTRÆA sp.		II		II	
43.	DENTALIUM sp.		II		II	
44.	UNKNOWN UNIVALVE				C	
45.	OSTREA flabellula	II C			II C	
46.	PINNA affinis	II	II			
47.	MODIOLA depressa	III II	II	II	C	
48.	MODIOLA elegans	II				
49.	AVICULA sp.	II			II	
50.	CARDIUM nitens	II	II		II C	
51.	CARDIUM semigranulatum	II	II	II	II C	
52.	CYTHEREA orbicularis	II			C	
53.	CYTHEREA lucida	II			C	
54.	CYTHEREA sp.	II				
55.	CYPRINA planata			II C	C	C
56.	CYPRINA Morissi			II	II C	
57.	CYRENA cuneiformis	II			II	
58.	CYRENA telinella	II	II			
59.	ASTARTE rugata	II				
60.	ASTARTE tenera		II			
61.	SANGUINOLARIA sp.		II			
62.	CORBULA globosa	II				
63.	LEDA minima				II	
64.	CULTELLUS affinis		II			
65.	PANOPEA intermedia	C				
66.	PANOPEA sp.	II				
F.	PHOLODOMYA sp.				II	II
67.	TEREDINA personata	II	II	II	II	
	BRYOZOA.					
68.	FENESTELLA sp.	II			C	III
	VERMES.					
70.	SERPULA heptagona	II			II	
71.	DITRUPA plana	II				
72.	VERMETUS Bognoriensis	III	III		C	
73.	UNKNOWN ANNELID				II	
	RADIATA.					
74	PENTACRINUS sp.	II				
69	Part of test of ECHINODERM		II			
	PLANTÆ.					
75	WOOD	II C	II		II	
76	RESIN	C		II	C	
	Total	48	32	8	50	7

[N.B. The numbers refer to those on the Specimens, to be found in the Museum.]

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Saturday, October 9th.

J. D. CRAWFORD, ESQ., O.W., gave a lecture on "Burma."

Burma, perhaps the most beautiful country in the world, consists for the most part of the valleys of three rivers, the Irrawadi, the Salwen and the Litang.

We had some connection with Burma as early as 1612 A.D., but it was not till 1824, when we occupied Rangoon, that we had serious thoughts of colonisation. We were driven from Rangoon later in the same year, but retook it in 1825. The fall of Mandalay took place in 1852.

The lecturer then asked the audience to accompany him on a military expedition up the Irrawadi to Rangoon. The river runs for miles among rice-fields, or more properly "paddi-fields." Here and there one passes a saw-mill where the teak from the mountains, which is floated down in large rafts, is dressed for exportation.

The "Sanbans," or small boats in which the expedition travelled, eventually arrived at Rangoon, a very progressive city. The Great Pagoda, which is entirely covered with gold, is said to be 2500 years old. It was built in honour of four curious relics of Buddha, and with its surrounding shrines contains much wonderful wood-carving. Other objects worthy of note at Rangoon are the Soolay Pagoda, which is the temple of the Wicked Spirit, the Royal Lakes, covering an area of 160 acres, and the Race-Course.

Mandalay, some 350 miles up the Irrawadi from Rangoon, is at first sight a very unpromising place, with its bleak isolated hill more than 300 feet high; but in reality it is one of the most delightful spots on earth. It is strongly fortified by a wall 30 feet thick and 30 feet high, of total length four miles, which is surrounded by a moat. The Castle, situated inside the fort is now partly blown down; it was styled by Hindu Miu, a former King of Burma, the "Centre of the Universe," and contains a wonderful carved throne. The Queen's house and gardens are now the beautiful scene of entertainments in the shape of tea-fights. The thousand-and-one pagodas, of which there are really seven hundred and twenty-nine, are of world-wide fame.

Situated five miles above Mandalay is the "foundation-stone," one hundred and sixty feet high, of what was to have been the largest pagoda in the world.

About one hundred miles down the river from Mandalay is Pagan, the Pagoda of which, built in 1028, contains two statues of Buddha forty feet high.

Some two hundred miles north of Mandalay by river is a remarkable construction in the river known as the Second

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defile; and just north of this again is Bhamo, the great frontier station, being only sixty miles from the frontier of Yunnan.

Having thus briefly alluded to the chief sights of the country, the lecturer proceeded to show slides of the various types of people. The Burmese women are usually good-looking, the test of beauty in the eyes of the Burman being fairness of complexion. They all smoke colossal cigarettes, or "rungigs." The men of the lower classes are tattooed from the waist down. A Burmese "family" consists of a round score of members, all the less fortunate relatives living on the means of their more illustrious kinsmen. The daughters of the family do not treat their elders with all the affection one would expect at home.

Then followed some interesting illustrations of the occupations of the people, teak-felling and dressing, rice-growing, wood-carving and silk weaving being among the chief. In the teak-forests elephant-labour is employed by the larger firms. The wood-carving is exquisite and can be bought very cheaply. The chief beast of burden in Burma is the water-buffalo, a ferocious-looking animal with enormous horns. The bullock-carts used in the jungle are built without springs, and are locally known as "Kachins."

Some remarks about the religion of the Burmese followed. Buddhism, a sort of reformed Brahminism, is prevalent. As the Burmese hold the doctrine of transmigration, they will not kill any animal. The priests are often indolent, living as they do by means of the begging-bowls. When a man dies he is pickled in honey and then burnt, the pickling of a good man sometimes lasting three years.

The lecture closed with some slides of a Burmese band, theatre and festivals. The festivals especially are very curious; there is always dancing, be it funeral or holy day.

A vote of thanks to the lecturer was proposed by Mr. Brabant.

Saturday, October 23rd.

S. A. Saunder, Esq., gave a lecture on "Some common mistakes with regard to the Moon."

The lecturer began by saying that most of the mistakes to which he was going to refer were due to want of thought, rather than to want of knowledge. A large part of the science

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of Astronomy,—though by no means the whole, consists in the application of common sense to a few well known and easily understood facts.

The lecturer assumed the knowledge of only three facts in what he was going to say that evening; first, that the earth turns on its axis; secondly, that the moon revolves round the earth in the same direction; and thirdly, that the earth and the moon are not self-luminous, but receive all their light from some other body.

The phases of the moon were explained by a diagram, due originally to Leonardo da Vinci, shewing how the moon is illuminated by the sun when in different positions with respect to the earth, and its consequent varying appearance. A useful rule for finding whether the moon is on the increase or on the wane is one better known in Germany than in England:—when the crescent is in the shape of a "D," the moon is "Crescens," *i.e.* waxing, when "C" shaped, it is "Decrescens," or on the wane, the initial letters being reversed.

Many instances then followed of mistakes made by authors, artists and poets with regard to the moon. It will be seen that if the moon is visible in the evening, it must be of "D"-shape, and therefore waxing, and similarly it must be waning if seen in the morning. Also an increasing moon will set in the evening and rise in the morning, so that when Merriman speaks of "the young moon rising from the sea" after dinner, or Dickens of the "Crescent moon which had not long left the horizon" in the evening, each author commits an error not easily overlooked by the astronomer. Further instances of this mistake followed from Whyte Melville and Hall Caine. These the lecturer compared with Lewis Caroll's "The sun was shining lustily, etc.," but this is intentional nonsense. Lever, in "Charles O'Malley" speaking of the night of June 15th, 1815, says "The bell tolled one, and there was visible the faint crescent of a new moon." This, by the calendar is impossible, as the moon was then well past its first quarter, and in any case a new moon would have set before one o'clock in the morning. Similar mistakes were made by the newspapers during the Franco-Prussian War, and by Wolfe in his "Burial of Sir John Moore," for there was a new moon the previous day. Benson, also, in "The Luck of the Vails," says: "As *a year ago*, a young moon, silver and slim, was climbing the sky." The moon does not, however, present the same phase on the same day of two successive years, there being more than twelve and less than thirteen lunar months in the year.

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Proceeding now to the artists, Turner's famous picture "The Fighting Temeraire," represents the gallant old ship being towed up Thames, *i.e. from* the east, with the sun setting behind it, *i.e. in* the east. The picture obviously represents a sunset, as is also proved by the fact that the moon is D-shaped and to the left of the sun; it is also not turned directly towards the sun, as it should be. Instances of mistakes made by artists were also quoted by the lecturer from an "Evening Scene," by Diana Coomans, and from two pictures shewn in this year's Academy by G. Clausen, R.A., and John Peddar. In an allegorical picture in the Paris Salon, Diana is represented using the crescent moon as a bow, and a star appears *inside* the crescent. The Turkish Flag presents the same impossibility. Coleridge writes: "The horned moon with one bright star within the nether tip," the star in all these cases shining *through* the dark part of the moon. In an illustration to a story that appeared in Pearson's Magazine, the moon is represented of abnormal size, and in such a position that the sun must have been in the middle of the heavens, whereas all the lights of the city are shining, shewing that it is evening.

In inserting a sun or a moon in a picture, the artist must remember that if he states the position from which the view is seen, he provides a scale by which all distances may be measured. By means of such a scale the heights were calculated of the hills in all the pictures exhibited in America in one particular year. The least was thirteen miles high, but the greatest was *one hundred and five*!

The lecturer then made some remarks as to the appearance of the earth from the moon. The earth gives thirteen times as much light to the moon as the moon gives to the earth. The appearance of the moon to the earth is complementary to that of the earth to the moon, *i.e.* when we see the moon full, a lunar observer would see a "new earth," The water on the earth appears darker than the land, but clouds appear very bright. At one time it was supposed that the dark parts of the moon were also seas, but a photograph of the moon shewed ridges on the dark parts which therefore cannot be seas. Some interesting remarks followed on the subject of distortion by "stopping down," which illustrated the difficulty in seeing the real shape of small markings on Mars, and may perhaps account for some of the divergences of opinion, amongst astronomers as to the much debated "canals."

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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Saturday, November 13th.

The Rev. Canon Fowler, D.Sc., gave a lecture on "Lower Forms of Animal Life."

A vote of thanks to the lecturer was proposed by Mr. Eustace.

Saturday, November 27th.

Captain C. F. Watson, D.S.O., gave a lecture on "Military Geography with relation to Probable Theatres of War."

A vote of thanks to the lecturer was proposed by Mr. Hagreen.

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MINUTES OF PRIVATE BUSINESS AND COMMITTEE MEETINGS.

Monday, February 8th.

At a P.B.M.: On the motion of the President it was agreed, That in Rule 2 the words "and the number of Associates to seventy" be omitted.

The following were elected Associates: E. W. B. Pim, L. A. Barrett, T. W. Williams, R. L. Haggard, R. O. Philips, Hon. R. H. B. Norton, P. L. Barrow, G. F. Griffith, C. W. E. Cradock Hartopp, G. H. Kernaghan, E. A. Spencer, A. W. I. Thomson, S. W. Lindrea, J. K. Manger, R. C. Guinness, C. L. Domville, G. R. Bolitho, D. A. G. Dallas, E. N. Bock, C. J. Temperley, C. E. B. Rogers, F. J. H. Waller, H. W. M. Paul, O. M. James, N. V. Gallwey, H. St. G. Dyke Marsh, A. N. Watson, G. B. Loyd, W. F. H. Mallins, W. E. Dent, D. A. F. Harris, H. T. Ackland Allen, G. S. T. Newbold, R. C. M. Raikes, V. G. Loyd, P. M. Ridout, C. R. Williams, J. G. Hutt, E. P. L. Pelly, J. H. E. T. Rawson, J. A. Graham Clarke, A. H. Jacob.

At a Committee Meeting J. L. C. Mercer was elected a Member.

Friday, May 7th.

At a P.B.M.: R. Elsdale and J. L. C. Mercer were elected Judges for the Pender Prize.

The following were elected Associates: A. E. Collier, H. B. Stokes, W. H. D. de Pass, R. A. C. Henderson, T. H. Beves, C. E. S. Beatson, F. de V. B. Allfrey, Prince Maurice of Battenberg, W. E. Houstoun Boswall, J. E. Norton, M. A. B. Johnston, G. J. T. H. Villiers, P. Grant, G. B. Ramsbotham, E. G. Earle, G. A. Skipwith, R. E. Kane, M. S. Harvey Jones, P. E. Johnson, H. E. Biggs, S. W. Thompson, L. C. Brown, A. C. Arnold, R. D. Pank, J. A. D. Skinner, V. A. Yate, C. A. Charlewood Turner, D. G. F. Macbean, B. H. B. Allen, R. H. Parker, A. G. de la Mare, H. A. Hamilton, H. A. J. Woodfall, H. Norton, R. A. Banon, J. K. Maitland, L. L. S. Clark,

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D. M. Parsons, A. F. B. Howard, H. C. Westmorland, F. N. Maltby, R. F. Newdigate, A. A. B. Thomson, A. L. Bayly, H. C. Cory, C. A. S. Morris, P. J. C. Honner, W. R. M. Crossman, R. G. Wilson, F. P. Lefroy, J. D. Inglis, J. W. Davidson, A. H. Smith, F. J. Hext, A. R. Austen, J. F. Houstoun Boswall, R. W. L. Fellowes, G. S. Spencer Smith, Sir T. R. Berney, J. D. Cartwright, B. G. White, A. B. Cramsie, S. C. Tinné, C. N. Vallentin, R. M. Watson, H. C. Des Vœux, G. B. Thomson, T. L. L. Green, C. P. Hancock, R. D. Waghorn.

Tuesday, October 5th.

At a P.B.M.: Votes of thanks were passed to P. Gaisford and A. C. Sykes, the retiring Secretary and Treasurer, for their services to the Society.

Æ. F. Q. Perkins was elected Secretary and H. R. Lupton Treasurer.

The following were elected Associates: A. J. C. Dodgshon, G. R. Parr, F. B. Geidt, P. Knox Shaw, W. W. Neville, J. L. Turing, E. G. Bartlett, C. W. C. Bain, C. Davis, C. L. Domville, J. C. Hallowes, R. St. J. Blacker Douglass, D. W. Hunter Blair, A. R. R. Woods, F. A. Somerset, G. M. Churcher, A. W. G. Windham, R. A. Maybery, S. L. MacWatt, N. V. Gallwey, C. R. Williams, C. U. Geidt, C. T. J. Hill, H. L. Mostyn Owen, M. J. Stillwell, R. I. Cowan, W. F. H. Mallins, N. H. Thornton, A. J. L. Donaldson, E. E. Mockler Ferryman, R. A. D. Watson, A. Hunter Blair, H. M. Wardrop, R. A. Jennings Bramly, N. A. C. Weir, R. C. M. Raikes, K. L. Godson, F. A. Hotblack, G. C. M. Jackson, B. Simpson, J. A. Graham Clarke, A. H. A. Jacob, E. L. J. Barstow, E. C. R. Kilkelly, G. A. Pilleau, R. A. Scott, R. A. D. McCulloch, C. V. J. Borton, C. H. Davies.

At a Committee Meeting, L. A. Barrett, Æ. F. Q. Perkins, O. S. Cumming were elected Members.

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PRIZES.

The Pender Prize.

In 1879, an Old Wellingtonian, Henry Denison Pender, one of the original members of the Society, announced his intention of giving an Annual Prize for the best essay on some scientific subject written by a Member or Associate of the Society. The Prize was to be called the "Eve Essay Prize," in honour of our first President. He lived only long enough to give the prize for 1880, when what had seemed a most promising career was cut short by an early death.

From that time, until her death in 1890, the prize was continued by his mother, Lady Pender, who asked that the name might be changed to the "Pender Prize," in memory of her son.

From 1890 to 1895 it was given by Sir John Pender, G.C.M.G.; and on his death, which occurred in 1896, it was found that he had left a bequest in his Will permanently establishing the prize.

The following are the regulations for the competition:—

1. That the Prize be called the "Pender Prize."

2. That the essays be sent anonymously to the President not later than the second Saturday in the Easter Term, with a sealed envelope containing the author's name.

3. That the prize be awarded by a Committee consisting of the President, Vice-Presidents, and two Members or Associates (to be elected by the Committee of the Society at the first meeting in the Easter Term), with power to add to their number.

4. That the Prize, which will be presented on Speech Day, must consist of scientific books or apparatus, chosen by the winner, subject to the approval of the President.

The winner may, if he choses, add to the value of the prize, but such addition must not exceed a small amount, and must receive the sanction of the President.

5. That the essay, which is expected to be the competitor's *bonâ fide* own work, may be on a subject connected with any branch of Science recognised by the Society or any other department of Science which shall receive the sanction of the President, but competitors must in all cases mention the subject chosen to the President and obtain his sanction, before sending in the essay.

6. That preference be given to essays containing accounts of original work of any kind. The authorities consulted (with references) for other statements are in all cases to be given.

In cases of equality between two essays, one on some

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branch of Physics, and the other on another subject, preference will be given to the former.

7. That competitors be not prohibited from writing a second essay on a subject chosen by them at a previous competition, but should they do so great importance will be attached to the work done and the advance made by them during the interval.

8. That the Examiners may, before finally awarding the prize, examine any competitor, *vivâ voce*, on the subject of his essay.

9. That the prize be open only to Members and Associates of the Society who shall have been elected not later than at the first meeting in the previous Lent Term, and who are members of the School at the date appointed for the essay to be sent in.

10. That the essay to which the prize is awarded be read by the writer before the Society during the Easter Term, on a day to be appointed by the Committee.

11. Essays should be of such a length as not to occupy more than three-quarters of an hour in delivery.

The prize for 1909 was awarded to H. R. Lupton for an Essay on "The Geology of the London Clay near Wellington College," of which an abstract is given on pp. 20—35.

Natural History Prizes.

I. Mr. Bevir offers a prize, value 10s., open to the Middle School for the best collection to illustrate some one branch of Natural History. For this prize all Orders of Insects may be considered as belonging to one branch.

II. The President of the N.S.S. offers a prize, value £1, open to Members and Associates of the Society, for the best collection to illustrate some one branch of Natural History (different Orders of Insects being considered as belonging to different branches). More credit will be given for collections illustrating the life history of particular species, *e.g.*, larva in different stages, pupa and imago, than for collections showing only the final stage of development, *e.g.*, butterflies and moths. Each collection must be accompanied by a note-book giving dates and localities for all the specimens, and which should also contain notes of any original observations, whether made in the neighbourhood or elsewhere, in the particular branch of Natural History illustrated. Should the collections deserve it, a second prize, value 10s., will be given by the N.S.S.

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III. One or more prizes are offered by the N.S.S. to Members and Associates for Note-Books containing accounts of original observations or of work done in any one branch of Natural History (different Orders of Insects being considered as belonging to different branches). These Note-Books should, where the subject admits of it, be accompanied by illustrative collections, but the absence of such collection will not necessarily debar a Note-Book from obtaining the prize.

For the prizes in Groups I and II the collections must be made in the neighbourhood, by the Competitor himself, during the period September—July. Insects bred by the Competitor from eggs or larvæ captured in the neighbourhood (but not elsewhere) may be included. All insects must have been set by the Competitor himself, but assistance may be obtained in naming specimens.

Note-Books may contain notes of work done elsewhere during the holidays, as well as of work done in the neighbourhood during term time.

The same collections and Note-Books may be entered for Groups II and III, but in awarding the prizes in Group II special attention will be given to the specimens, in Group III to the value of the work done and the observations recorded.

In July, 1909, the prize in Group I was awarded to J. K. Maitland.

In Group II the prize was awarded to J. K. Maitland.

In Group III the prize was awarded to A. E. Clark-Kennedy.

Photographic Prizes.

Mr. Blundell offered a prize in the Summer Term, value £1, to Members of the Photographic Section, for the best photographs of Natural History subjects. This was awarded to O. S. Cumming.

Mr. Longland offered a prize in the Summer Term for the best photographs of Birds' Nests, Eggs and Young Birds. This was awarded to A. E. Collier.

Mr. Perkins offered a prize in the Autumn Term for the best enlargements. This was divided between R. M. Chadwick and D. P. Gordon.

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WINNERS OF THE "EVE ESSAY" PRIZE.

Date.	Winner.		Subject.
1879	C. R. Ashbee	...	The Microscope.
1880	T. L. Mackesy	...	Geological Notes.

WINNERS OF THE "PENDER" PRIZE.

1881	H. G. Lyons	...	A sketch of the rocks of Dublin.
1882	J. G. Carew Gibson	.	Locomotives.
1883	T. E. Crawhall	...	The Telephone and Microphone.
1884	J. S. Marriner	...	English Beetles.
1885	J. S. Marriner	...	British Flies.
1886	S. S. Flower	...	Reptiles.
1887	A. C. Deane	...	The Inhabitants of a drop of water.
1888	A. C. Deane	...	The Structure of Insects.
1889	A. C. Deane	...	The Frog.
1890	F. H. Wolley Dod	...	Rooks and Crows.
1891	J. Warren ...	...	Toads.
1892	I. D. Ghica ...	...	Ants.
1893	W. Shelley ...	...	Bees.
1894	T. Henderson	...	The Life of a Bucks Decoy Pond throughout the year.
1895	H. C. Hayward	..	Protective Resemblances amongst English Lepidoptera.
1896	J. D. M. Parker	...	Locomotives.
1897	H. H. J. Fawcett	...	The Fertilisation of Plants.
1898	Not awarded.		
1899	H. O. O'Hagan	...	Thames Fish and their habits.
1900	G. K. Allen	...	Flint Implements.
1901	C. J. C. Street	...	The Scenery of Hampshire from a Geological point of view.
1902	W. Leith Ross	...	The Geology of part of the Coast of Aberdeenshire.
1903	Not awarded.		
1904	J. P. G. Worlledge	...	Glaciers and the Glaciation of a specified district in Breconshire.
1905	E. F. A. Hay	...	The Birds of the Welsh Coast.
1906	W. E. Pain ..	...	The Raven
1907	L. Lawrence Smith		Crows and Rooks.
1908	A. E. Clark Kennedy		Pond Life.
	Second Prize, A. C. Sykes		The Dipper or Water-Ouzel.
1909	H. R. Lupton	...	The Geology of the London Clay near Wellington College.

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METEOROLOGICAL REPORT.

JANUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·60	47·1	36·3	42·4	42·4	100	10	trace	N.
2	·62	46·9	42·2	44·7	44·7	100	10	·03	S.W.
3	·61	48·1	44·3	45·8	45·8	100	10		N.E.
4	·66	44·9	41·4	44·1	44·1	100	10		N.E.
5	·55	40·1	30·5	34·1	33·6	93	10	·03	S.E.
6	·39	45·9	30·5	39·9	39·7	98	10		S.E.
7	30·28	46·9	33·6	40·2	39·2	92	10	·02	S.W.
8	29·83	41·9	35·5	38·1	36·3	85	10		S.
9	30·18	42·2	31·3	33·9	32·0	81	5	·09	N.W.
10	29·95	49·5	33·0	42·1	41·9	98	10	·16	S.W.
11	·65	48·7	41·5	46·4	46·2	99	10		S.W.
12	·67	45·4	37·9	38·4	36·8	86	8	·04	W.
13	·55	45·9	30·3	36·3	36·0	97	10	·07	E.
14	·40	50·2	36·1	40·6	37·6	76	5	·10	W.
15	·32	46·4	35·8	35·6	34·3	88	0	·06	W.
16	29·51	41·6	34·3	35·3	33·4	83	10	trace	W.
17	30·13	50·1	33·5	36·9	36·0	92	7	·02	S.W.
18	29·97	49·9	33·8	46·7	44·1	81	10	·05	S.W.
19	30·00	42·9	38·7	39·2	38·3	93	10		N.
20	·37	41·1	24·2	26·7	26·7	100	0		N.W.
21	·45	40·9	25·2	32·7	32·6	98	10	trace	N.E.
22	·28	38·3	31·8	34·3	33·1	87	10		N.
23	·13	33·1	30·5	31·2	30·3	88	10		N.E.
24	·08	34·3	27·6	29·9	29·6	94	10		S.E.
25	·30	33·9	24·3	25·1	25·1	100	0		E.
26	·45	38·4	21·5	31·7	31·6	98	10		N.E.
27	·44	34·7	23·5	28·3	28·2	98	10		N.E.
28	·35	34·9	23·2	24·2	24·2	100	10		E.
29	·13	45·9	16·2	33·9	33·8	98	10	trace	S.
30	·03	37·5	33·3	37·1	36·6	95	10	trace	N.W.
31	30·01	40·6	24·5	33·3	33·2	99	10	·12	N.W.
								Total	
Mean	30·13	42·8	31·8	36·4	35·7	93	8·6	·79	
Mean for 27 years	30·00	43·4	32·4	37·8	36·9	90	8·3	1·93	

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Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·86	43·9	32·5	40·7	40·7	100	10		N.W.
2	30·11	51·9	27·4	36·7	34·3	79	10	trace	S.W.
3	29·89	52·9	36·5	51·7	49·2	83	10		W.
4	30·00	55·9	50·0	52·7	50·2	83	10		W.
5	29·73	48·9	45·3	46·7	41·9	67	8		N.W.
6	30·12	45·7	30·3	39·4	39·1	98	10		N.W.
7	·11	44·9	19·0	32·1	32·1	100	0		S.E.
8	30.19	40·1	28·7	33·3	33·3	100	10		E.
9	29·81	41·2	28·4	37·7	37·4	97	10	·10	S.
10	·38	37·9	31·3	35·4	35·1	97	10	·12	S.W.
11	29·67	40·9	32·3	37·7	36·2	87	10	·05	S.W.
12	30·07	36·9	29·7	32·4	31·7	90	5		N.E.
13	·43	39·1	27·6	34·4	33·9	94	5		E.
14	·45	42·9	20·5	30·4	30·4	100	10	·03	N.W.
15	·21	48·1	29·7	42·7	42·7	100	10		N.W.
16	·16	48·1	25·4	37·4	36·4	91	0		N.E.
17	30·06	45·9	25·7	35·4	35·0	96	0		N.E.
18	29·91	46·1	26·6	42·1	41·4	95	5		N.E.
19	30·09	49·9	24·8	37·1	36·6	95	0		N.E.
20	·28	51·2	26·4	41·9	41·4	96	0		S.E.
21	·41	52·9	24·7	33·4	33·3	98	0		S.E.
22	·44	47·9	18·0	27·7	27·7	100	0		N.E.
23	·30	49·5	15·8	37·7	36·9	93	0		N.W.
24	·29	42·7	24·5	30·6	30·3	95	5		N.E.
25	·28	36·9	21·2	34·1	33·8	96	10		N.E.
26	·28	37·1	28·9	33·4	32·3	88	10	·05	N.E.
27	30·10	33·9	27·9	32·1	31·8	96	10	·10	N.
28	29·82	33·5	28·7	35·1	35·0	100	10	·09	E.
								Total	
Mean	30·09	44·5	28·1	37·2	36·4	93	6·4	·54	
Mean for 27 years	29·99	45·0	32·3	44·8	37·2	88	7·7	1·68	

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MARCH.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·76	34·9	26·9	31·6	31·2	94	10		N.E.
2	·43	37·9	17·1	30·7	30·0	88	10	·03	S.
3	·12	32·7	15·8	25·9	25·9	100	10	·16	N.W.
4	·38	35·1	23·7	31·1	30·8	95	8		N.W.
5	·61	41·7	14·8	32·9	32·0	88	0	·27	S.W.
6	·18	38·9	28·3	33·1	33·0	98	10	·82	S.E.
7	·12	45·7	32·1	34·1	33·8	96	0	·04	W.
8	·52	50·9	30·5	39·3	38·6	94	4		S.
9	·62	38·9	33·3	34·9	34·0	90	10	·02	N.E.
10	·63	40·9	33·3	37·7	37·7	100	10	·07	N.E.
11	·70	40·9	34·3	34·7	34·4	96	10	trace	N.
12	·92	41·4	32·3	34·1	33·3	91	10		N.E.
13	29·82	42·3	31·3	39·4	37·0	81	5	·26	N.
14	30·14	35·5	32·1	33·1	32·8	96	10	·03	N.
15	29·12	37·4	27·8	34·9	33·5	85	10	·02	N.
16	·46	42·2	24·3	35·2	34·8	96	5		N.
17	·56	46·9	20·5	41·2	40·7	96	0	·02	S.W.
18	·28	48·1	32·5	46·1	44·1	85	10	·35	S.W.
19	·23	55·4	40·2	46·7	44·9	87	5	·14	S.
20	·41	53·6	40·2	48·1	48·1	100	0	·03	S.E.
21	·55	47·9	32·8	42·6	41·7	93	0	·06	S.
22	·63	48·9	40·6	43·7	43·7	100	10	·05	S.
23	·72	52·2	42·6	44·9	44·7	98	10	·03	N.E.
24	·72	50·1	30·0	47·1	47·0	100	10	·30	S.
25	·22	52·4	43·4	49·1	44·4	70	9	·05	S.W.
26	·53	48·4	36·3	44·9	40·2	70	8		W.
27	·81	52·2	25·2	45·4	40·1	65	8	·15	S.W.
28	·50	53·3	39·6	43·7	43·7	100	10	·16	S.E.
29	·24	59·3	43·2	53·1	50·0	80	10	·56	S.W.
30	·25	50·9	45·5	45·9	45·9	100	10	·07	W.
31	29·55	49·9	37·5	48·1	45·7	82	10	trace	W.
								Total	
Mean	29·51	45·4	32·2	39·8	38·6	91	8·1	3·69	
Mean for 27 years	28·88	49·5	33·4	42.0	40·0	84	7·4	1·90	

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FEBRUARY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·86	43·9	32·5	40·7	40·7	100	10		N.W.
2	30·11	51·9	27·4	36·7	34·3	79	10	trace	S.W.
3	29·89	52·9	36·5	51·7	49·2	83	10		W.
4	30·00	55·9	50·0	52·7	50·2	83	10		W.
5	29·73	48·9	45·3	46·7	41·9	67	8		N.W.
6	30·12	45·7	30·3	39·4	39·1	98	10		N.W.
7	·11	44·9	19·0	32·1	32·1	100	0		S.E.
8	30.19	40·1	28·7	33·3	33·3	100	10		E.
9	29·81	41·2	28·4	37·7	37·4	97	10	·10	S.
10	·38	37·9	31·3	35·4	35·1	97	10	·12	S.W.
11	29·67	40·9	32·3	37·7	36·2	87	10	·05	S.W.
12	30·07	36·9	29·7	32·4	31·7	90	5		N.E.
13	·43	39·1	27·6	34·4	33·9	94	5		E.
14	·45	42·9	20·5	30·4	30·4	100	10	·03	N.W.
15	·21	48·1	29·7	42·7	42·7	100	10		N.W.
16	·16	48·1	25·4	37·4	36·4	91	0		N.E.
17	30·06	45·9	25·7	35·4	35·0	96	0		N.E.
18	29·91	46·1	26·6	42·1	41·4	95	5		N.E.
19	30·09	49·9	24·8	37·1	36·6	95	0		N.E.
20	·28	51·2	26·4	41·9	41·4	96	0		S.E.
21	·41	52·9	24·7	33·4	33·3	98	0		S.E.
22	·44	47·9	18·0	27·7	27·7	100	0		N.E.
23	·30	49·5	15·8	37·7	36·9	93	0		N.W.
24	·29	42·7	24·5	30·6	30·3	95	5		N.E.
25	·28	36·9	21·2	34·1	33·8	96	10		N.E.
26	·28	37·1	28·9	33·4	32·3	88	10	·05	N.E.
27	30·10	33·9	27·9	32·1	31·8	96	10	·10	N.
28	29·82	33·5	28·7	35·1	35·0	100	10	·09	E.
								Total	
Mean	30·09	44·5	28·1	37·2	36·4	93	6·4	·54	
Mean for 27 years	29·99	45·0	32·3	44·8	37·2	88	7·7	1·68	

MARCH.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	29·76	34·9	26·9	31·6	31·2	94	10		N.E.
2	·43	37·9	17·1	30·7	30·0	88	10	·03	S.
3	·12	32·7	15·8	25·9	25·9	100	10	·16	N.W.
4	·38	35·1	23·7	31·1	30·8	95	8		N.W.
5	·61	41·7	14·8	32·9	32·0	88	0	·27	S.W.
6	·18	38·9	28·3	33·1	33·0	98	10	·82	S.E.
7	·12	45·7	32·1	34·1	33·8	96	0	·04	W.
8	·52	50·9	30·5	39·3	38·6	94	4		S.
9	·62	38·9	33·3	34·9	34·0	90	10	·02	N.E.
10	·63	40·9	33·3	37·7	37·7	100	10	·07	N.E.
11	·70	40·9	34·3	34·7	34·4	96	10	trace	N.
12	·92	41·4	32·3	34·1	33·3	91	10		N.E.
13	29·82	42·3	31·3	39·4	37·0	81	5	·26	N.
14	30·14	35·5	32·1	33·1	32·8	96	10	·03	N.
15	29·12	37·4	27·8	34·9	33·5	85	10	·02	N.
16	·46	42·2	24·3	35·2	34·8	96	5		N.
17	·56	46·9	20·5	41·2	40·7	96	0	·02	S.W.
18	·28	48·1	32·5	46·1	44·1	85	10	·35	S.W.
19	·23	55·4	40·2	46·7	44·9	87	5	·14	S.
20	·41	53·6	40·2	48·1	48·1	100	0	·03	S.E.
21	·55	47·9	32·8	42·6	41·7	93	0	·06	S.
22	·63	48·9	40·6	43·7	43·7	100	10	·05	S.
23	·72	52·2	42·6	44·9	44·7	98	10	·03	N.E.
24	·72	50·1	30·0	47·1	47·0	100	10	·30	S.
25	·22	52·4	43·4	49·1	44·4	70	9	·05	S.W.
26	·53	48·4	36·3	44·9	40·2	70	8		W.
27	·81	52·2	25·2	45·4	40·1	65	8	·15	S.W.
28	·50	53·3	39·6	43·7	43·7	100	10	·16	S.E.
29	·24	59·3	43·2	53·1	50·0	80	10	·56	S.W.
30	·25	50·9	45·5	45·9	45·9	100	10	·07	W.
31	29·55	49·9	37·5	48·1	45·7	82	10	trace	W.
Mean	29·51	45·4	32·2	39·8	38·6	91	8·1	Total 3·69	
Mean for 27 years	28·88	49·5	33·4	42.0	40·0	84	7·4	1·90	

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APRIL.

Date.	Barom. reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·94	46·1	40·4	41·1	38·9	83	10		N.E.
2	30·45	48·4	23·9	45·2	38·9	60	6		E.
3	·45	40.7	30·5	45·1	44·2	93	10		N.E.
4	30·40	53·1	29·7	42·3	37·3	64	0		S.E.
5	·27	54·9	33·0	45·2	38·7	59	0		N.E.
6	·27	59·8	28·5	52·2	44·4	55	0		E.
7	·37	64·6	25·6	54·7	45·9	51	0		S.
8	·35	67·4	26·4	59·4	45·6	37	0		N.E.
9	·26	71·4	27·2	53·9	45·1	51	0		N.E.
10	30·14	72·7	31·5	55·2	47·4	56	0		N.W.
11	29·89	70·4	34·3	60·1	50·0	50	0		S.W.
12	·76	56·9	39·4	51·9	48.8	80	8	·02	W.
13	·68	51·6	41·8	49·4	47·1	84	10	·31	S.W.
14	29·65	59·1	45·1	45·2	45·2	100.	10	trace	N.W.
15	30·00	62·0	31·5	53·7	48·2	67	0		S.
16	29·90	62·2	37·3	49·7	44·9	69	10	·06	S.W.
17	·91	58·9	43·2	55·1	52·5	83	10	·01	S.W.
18	·85	62·0	47·3	53·4	49·9	78	10		S.W.
19	·96	67·0	31·8	58·9	51·3	58	8	·65	S.W.
20	·96	59·8	44·8	55·1	48·0	60	10		S.W.
21	·96	61·8	30·3	57·5	48·2	52	8		S.E.
22	·76	61·1	38·2	56·9	49·3	57	10	·22	S.W.
23	·80	61·0	46·1	57·4	51·8	68	10	·12	S.W.
24	·60	59·3	46·3	58·2	53·0	70	8		S.W.
25	·71	61·8	41·2	55·9	50·0	66	7	·05	S.E.
26	·74	64·8	39·9	61·2	52·5	56	5	·17	S.E.
27	29·68	57·2	45·1	52·1	50·8	91	10	·17	S.
28	30·01	61·0	40·2	55·1	47·7	58	4	·09	W.
29	29·85	57·4	39·4	51·7	46·9	70	6	·22	W.
30	30·09	50·1	35·5	44·9	44·7	98	8	·07	W.
								Total	
Mean	29·99	59·5	36·5	52·6	46·9	67	5·9	2·16	
Mean for 27 years	29·89	55·8	36·7	48·1	44·6	77	7·1	1·60	

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MAY.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·05	50·3	32·3	44·5	41·1	76	8	trace	S.W.
2	·29	52·9	28·4	46·1	42·9	77	0		N.W.
3	·39	60·8	33·7	51·5	49·5	86	5		S.W.
4	·39	64·0	35·3	60·7	49·0	44	6		S.W.
5	·22	67·6	36·3	60·4	48·3	43	0		N.W.
6	·20	68·9	48·1	67·1	54·5	44	0		E.
7	·20	63·8	43·4	59·9	49·0	46	0		N.E.
8	·13	64·4	40·4	60·9	48·5	48	0		S.E.
9	·02	61·5	30·6	56·2	45·1	45	0		N.
10	·05	61·1	42·2	51·9	46·4	66	5		N.E.
11	·18	69·9	40·0	61·1	57·5	79	0		S.W.
12	·18	71·9	38·7	66·1	59·9	67	0		S.W.
13	·29	54·1	30·5	52·4	49·3	80	8	·04	N.E.
14	·14	50·9	35·3	42·4	42·4	100	10		E.
15	·07	54·6	28·7	46·2	45·4	94	8		N.E.
16	30·00	56·4	28·9	50·9	48·2	81	8	·14	E.
17	29·80	60·0	40·6	43·7	43·1	95	10	trace	N.
18	30·12	63·6	33·5	58·2	54·0	75	8	·17	N.E.
19	·28	70·9	34·5	62·9	62·4	97	8		S.
20	·28	77·1	35·6	70·7	60·4	53	0		S.E.
21	·08	81·2	40·2	74·9	61·2	44	0		S.E.
22	·13	79·7	47·1	70·4	62·7	62	0		W.
23	30·17	75·6	48·1	69·2	60·1	57	5		S.W.
24	29·35	73·4	40·4	68·7	58·3	52	2	·95	S.
25	·72	62·0	50·2	54·1	54·1	100	10	·18	S.
26	·51	59·3	42·2	49·9	49·5	97	10	·01	S.
27	·51	61·0	49·1	57·1	51·8	70	8	·16	S.W.
28	29·91	65·3	42·2	60·7	53·5	61	8	·09	S.E.
29	30·01	65·8	48·1	59·9	53·2	63	5		S.W.
30	·25	70·6	41·8	58·1	53·7	74	10		W.
31	30·09	72·9	49·9	66·7	60·5	67	2	·02	S.
								Total	
Mean	30·06	64·9	39·2	58·2	52·1	69	4·6	1·76	
Mean for 27 years	29·96	60·5	42·4	54·6	50·1	74	6·9	1·75	

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JUNE.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	29·87	73·1	50·2	56·7	56·0	95	10	1·34	N.E.
2	29·98	52·2	47·3	49·2	49·2	100	10	·02	N.E.
3	30·05	52·9	46·1	51·1	47·1	74	10	·36	N.E.
4	29·73	53·9	43·4	45·9	45·7	99	10	·31	N.E.
5	·77	55·6	45·3	53·1	51·0	86	10	·07	N.E.
6	29·84	53·2	43·8	45·7	45·4	98	10	.06	E.
7	30·04	60·3	45·1	52·9	48·8	74	10		E.
8	·10	66·0	39·2	59·7	53·2	64	0		W.
9	·08	62·8	43·2	58·4	53·5	72	8		W.
10	30·01	55·9	42·2	51·5	51·0	97	10	·11	N.E.
11	29·91	54·1	37·3	47·4	46·1	90	10		N.
12	30·07	56·3	42·4	52·9	49·0	75	8	·07	N.
13	·14	66·2	40·0	54·7	51·3	78	5		N.
14	·26	69·2	45·3	60·2	53·2	62	5		N.W.
15	·26	63·0	44·5	58·1	52·2	67	5		N.E.
16	·27	66·0	47·1	51·7	49·0	82	10		N.
17	·31	70·9	44·8	62·2	56·6	69	5		N.
18	·36	68·1	42·7	58·1	54·2	77	10		N.W.
19	·30	69·9	49·3	60·7	57·9	83	10	·03	S.
20	30·08	68·9	54·8	59·9	58·1	89	10		S.W.
21	29·74	65·3	53·2	61·7	57·5	76	10	·22	W.
22	·39	61·3	50·0	52·7	52·2	97	10	·02	S.W.
23	·56	59·8	53·2	54·9	52·0	79	10	·58	S.W.
24	·38	60·3	49·2	58·4	55·2	81	8	·19	W.
25	·71	58·8	49·7	51·5	51·2	98	10	·15	W.
26	·89	62·8	47·3	58·4	52·3	66	8	·22	W.
27	29·91	61·4	48·3	50·9	50·7	99	10		N.W.
28	30·00	64·0	41·7	59·1	53·0	66	7	·08	S.W.
29	29·88	62·8	50·0	57·4	56·0	90	10	·06	N.
30	30·01	62·8	44·7	55·5	54·8	95	10		N.
								Total	
Mean	29·96	61·9	46·0	55·0	52·1	83	8·6	3·89	
Mean for 27 years	30·04	67·8	47·5	59·1	55·4	75	7·1	2·12	

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JULY.

Date	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/°	0—10	In.	
1	30·19	62·0	41·2	56·7	53·0	77	10		N.
2	·25	70·9	41·5	61·7	56·0	69	5		E.
3	·20	71·2	45·1	62·9	59·4	80	8	·12	S.
4	·01	69·9	48·3	63·9	62·2	89	8		W.
5	30·09	69·9	47·3	64·1	58·1	68	10		W.
6	29·68	60·0	53·2	57·1	55·3	88	10	·30	W.
7	·63	65·1	50·6	56·9	55·0	88	10	.04	W.
8	29·94	66·3	51·0	63·1	58·1	73	8		W.
9	30·06	72·9	46·3	61·2	58·9	86	10	·18	W.
10	29·69	65·3	53·0	58·1	53·0	71	10	·01	W.
11	29·85	61·0	45·7	57·4	53·4	76	8	·22	N.W.
12	30·06	66·8	49·4	56·9	52·3	72	10	trace	W.
13	·11	70·9	49·6	66·1	62·9	82	8	·05	W.
14	·15	71·9	57·0	64·1	59·9	76	8	·02	S.W.
15	30·11	71·1	54·0	65·4	59·7	70	10	·06	S.
16	29·93	67·3	53·2	68·7	58·1	51	10	trace	S.W.
17	30·08	73·9	58·3	67·1	63·1	78	10		S.W.
18	·22	75·9	58·7	63·9	59·4	75	8		S.W.
19	·28	73·1	56·3	67·4	57·7	54	6		W.
20	30·28	74·9	43·4	64·9	56·2	57	5	trace	W.
21	29·93	69·2	54·2	62·7	59·4	81	10		W.
22	·83	69·2	55·0	63·1	58·5	74	10	·02	W.
23	·79	68·9	53·0	64·1	56·0	59	8	trace	S.W.
24	·79	61·6	49·1	58·1	53·5	73	10	·28	S.W.
25	·60	64·1	52·0	60·3	56·3	76	10	·06	S.W.
26	·66	65·3	49·7	62·1	55·5	64	8	·04	W.
27	·96	62·6	47·1	59·9	56·9	82	10	1·05	S.
28	·89	69·5	54·1	62·1	61·2	95	10		N.
29	·97	71·7	53·2	62·6	58·9	78	10	·03	W.
30	·85	71·4	57·2	60·1	59·9	99	10	·05	W.
31	29·97	72·5	56·8	68·1	64·4	80	10		W.
								Total	
Mean	29·97	67·9	51·1	62·3	57·8	76	9.0	2·53	
Mean for 27 years	30·00	70·8	51·3	63·4	58·7	75	7·1	2·05	

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AUGUST.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	°/o	0—10	In.	
1	30·05	67·3	51·6	64·4	60·8	79	9	·50	W.
2	29·99	61·3	51·0	56·9	54·2	83	5	trace	N.W.
3	30.23	64·8	39·2	56·9	50·2	62	5		N.W.
4	·24	72·5	39·2	64·7	59·9	73	10		N.W.
5	·30	74·7	46·6	65·5	59·7	69	0		N.W.
6	·26	76·4	49·1	70·1	62·5	62	0		E.
7	·18	78·2	48·3	69·7	63·1	66	0		N.E.
8	·12	79·4	49·6	68·1	61·9	68	0		N.E.
9	·07	80·1	48·8	68·7	62·7	69	0		N.E.
10	·21	78·4	50·2	66·6	61·7	74	0		N.
11	·32	80·2	53·2	59·5	58·7	94	10		S.W.
12	·29	85·1	52·4	70·4	62·2	60	0		N.W.
13	·19	78·2	51·5	69·9	61·7	60	2		W.
14	·25	79·5	50·4	69·7	65·4	77	5		W.
15	30·15	83·5	48·1	72·1	68·1	79	0		S.
16	29·82	70·3	52·8	72·4	65·4	65	10		S.
17	·80	68·7	42·5	62·6	58·7	78	5	·78	S.
18	29·46	67·0	44·2	59·9	59·1	94	10	·12	S.W.
19	30·04	71·7	40·5	64·1	59·7	75	8	·02	S.W.
20	30·07	63·3	43·2	61·9	60·2	90	10	·22	S.W.
21	29·73	66·3	39·7	58·2	53·7	74	5		N.W.
22	·71	66·0	41·0	56·1	51·4	75	4		N.W.
23	·84	62·6	43·2	60·7	56·5	75	8	·04	S.
24	·84	65·0	56·0	62·4	59·6	83	10	·34	S.W.
25	29·75	66·3	53·3	60·1	59·2	94	10	·32	W.
26	30·01	61·3	51·4	55·5	53·8	89	10		N.
27	·09	66·8	45·3	59·4	55·0	74	2		S.W.
28	·23	70·8	41·2	63·1	56·5	65	0		S.
29	30·07	67·0	44·7	59·1	56·2	83	7	·11	S.
30	29·90	61·3	50·0	55·8	50·2	67	5		N.W.
31	29·74	59·6	45·3	57·1	50·1	61	7		N.W.
								Total	
Mean	30·03	70·8	47·2	63·3	58·6	75	5·1	2·45	
Mean for 27 years	29·97	70·1	50·5	62·3	58·2	77	6·8	2·20	

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SEPTEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·91	59·6	38·1	54·9	49·3	66	7	·12	W.
2	30·05	64·1	33·4	49·9	49·1	94	2		N.
3	·21	62·0	36·7	63·8	56·3	61	5		S.W.
4	30·03	59·9	52·0	58·1	55·1	82	10	·13	S.
5	29·99	64·6	48·9	54·4	51·1	81	8	·04	N.W.
6	·79	69·6	48·3	62·9	59·8	82	10		S.
7	·67	67·1	47·3	56·7	50·9	66	8	·11	S.W.
8	29·89	54·8	33·2	51·8	48·8	80	5	·21	N.W.
9	30·11	60·8	43·0	53·9	51·5	83	5	·21	N.W.
10	29·96	59·0	38·7	51·1	51·0	100	10	·18	N.
11	·86	63·8	50·1	57·8	57·8	100	10		E.
12	29·98	65·7	50·0	59·5	56·2	81	3	·13	N.
13	30·00	54·9	50·4	51·3	51·5	100	10	·17	N.
14	·26	56·8	48·9	54·2	50·8	78	7		N.W.
15	·23	59·9	37·5	55·0	53·0	86	8	·12	N.W.
16	·09	61·8	48·1	53·9	53·9	100	10	·01	N.
17	·09	65·0	47·1	61·1	59·7	91	10	·29	N.
18	·11	61·9	51·8	55·1	54·9	99	10		N.
19	·11	65·8	40·2	54·8	53·1	89	2		N.W.
20	30·05	66·0	42·3	58·0	56·0	87	0	trace	W.
21	29·94	68·1	35·3	53·9	50·0	76	10		E.
22	29·90	69·4	47·3	66·4	60·4	68	0	trace	S.
23	30·02	68·1	54·2	58·4	58·1	98	10	·03	S.
24	·17	66·1	51·3	62·1	58·2	78	2	·06	S.
25	·12	63·8	53·0	59·9	59·1	94	8	·06	W.
26	·20	62·0	50·8	53·1	52·5	96	10		N.
27	·20	59·0	38·1	51·4	49·3	86	5	·11	N.E.
28	30·04	52·9	44·4	49·7	49·7	100	10	·60	S.E.
29	29·86	54·9	47·1	52·4	52·4	100	10	·48	E.
30	29·91	60·8	43·2	50·4	50·4	100	10	·05	E.
								Total	
Mean	30·03	62·3	45·0	55·9	53·7	87	7·2	3·11	
Mean for 27 years	30·03	65·4	47·3	58·1	55·1	82	7·0	1·84	

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OCTOBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·63	66·1	47·6	59·9	59·7	99	10	trace	S.
2	·81	63·0	47·3	53·9	53·2	95	10	·14	S.W.
3	·74	63·3	53·4	59·7	59·7	100	10	·10	S.E.
4	·77	63·2	57·5	59·9	57·6	86	10	·03	S.W.
5	·44	66·1	56·0	61·1	58·4	84	10	·04	S.W.
6	·86	61·3	38·2	57·2	51·5	68	0		W.
7	·91	62·3	42·2	56·9	52·2	72	10	·60	W.
8	29·63	63·8	52·0	57·9	56·0	88	8	·04	S.W.
9	30·27	62·2	35·3	59·4	52·8	63	2	·03	S.
10	30·08	59·8	48·9	56·1	55·3	82	10	·16	S.W.
11	29·89	64·1	54·2	57·4	56·5	94	10	·20	S.E.
12	.83	60·8	41·4	59·5	55·8	78	10	·30	S.
13	29·72	59·0	52·0	53·1	53·0	100	10	trace	S.
14	30·01	61·3	37·5	57·1	52·3	72	5	·05	S.
15	29·79	59·8	51·0	58·1	57·3	94	10	·12	S.
16	·71	61·1	45·2	59·1	58·9	99	10	·52	S.
17	·51	59·8	56·6	57·2	52·3	72	10	·11	S.W.
18	29·71	62·0	51·4	58·1	56·3	88	10		S.
19	30·01	65·0	50·0	56·1	55·0	93	10	·01	W.
20	29·85	58·3	50·0	57·5	57·5	100	10	·39	S.
21	29·94	59·8	47·3	54·7	52·8	87	5	·01	S.W.
22	30·19	60·0	43·4	56·1	54·2	88	10		S.W.
23	29·94	60·4	53·0	59·4	56·8	84	10	·10	S.
24	·73	53·9	45·9	50·7	46·9	74	10	·04	W.
25	.88	50·9	36·5	47·5	43·7	74	0	·14	N.W.
26	·48	46·9	31·5	45·1	44·9	99	10	·69	N.E.
27	·41	45·9	42·2	43·9	43·1	94	10	·33	N.E.
28	·53	46·1	41·4	45·5	42·5	78	10	1·26	N.
29	·74	43·9	35·3	38·7	37·0	96	10	·02	W.
30	·95	41·2	23·5	38·1	37·4	94	10	·02	N.W.
31	29·98	47·9	28·9	41·1	36·9	69	10	·21	N.
								Total	
Mean	29·80	58·0	45·1	54·6	51·9	86	8·7	5·63	
Mean for 27 years	29·92	56·7	41·9	50·2	48·3	87	7·5	3·23	

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NOVEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	30·15	48·9	40·2	47·1	44·7	82	10	trace	N.
2	·10	54·1	39·7	45·1	44·7	97	10	·02	S.W.
3	·09	54·9	43·4	52·9	52·9	100	10	·02	S.W.
4	·15	52·2	47·3	49·9	49·2	95	10	trace	S.W.
5	·16	50·9	38·4	51·1	49·3	88	0	·07	N.
6	·02	55·9	27·6	41·4	41·4	100	10		S.E.
7	·09	47·7	33·1	44·1	44·1	100	10		N.
8	·29	47·9	28·6	43·1	42·1	92	0	trace	N.E.
9	30·21	49·1	23·5	42·2	40·9	89	0	·01	W.
10	29·97	47·9	35·5	46·1	45·7	97	0		W.
11	30·15	59·0	37·5	42·1	41·1	92	0		W.
12	29·91	53·9	41·2	51·7	49·3	83	10		S.W.
13	·67	58·3	38·2	46·1	41·4	68	2	·03	S.W.
14	·59	41·2	27·6	35·2	34·2	91	10	·07	E.
15	·65	41·1	33·5	37·9	37·3	78	8		N.E.
16	·92	42·7	29·4	38·9	36·6	81	8	·03	N.
17	29·97	45·9	33·3	42·1	38·1	70	2	·03	N.E.
18	30·04	44·9	38·2	43·1	41·1	84	10		E.
19	·12	41·9	35·3	39·9	35·6	68	8		E.
20	30·14	43·1	25·4	35·4	33·3	81	10		E.
21	29·91	41·7	25·7	31·1	30·5	91	10		N.W.
22	29·95	39·7	26·4	33·2	31·6	83	5	·01	N.W.
23	30·30	36·9	24·7	34·7	32·6	79	10		N.W.
24	·37	41·9	26·4	36·1	34·6	87	6		W.
25	·29	43·1	34·3	41·7	40·7	92	6		W.
26	30·14	44·9	27·6	40·5	39·1	88	10		S.W.
27	29·99	52·7	29·4	43·7	40·1	74	10	·04	S.E.
28	·81	51·6	40·4	49·1	47·7	90	10	·06	S.W.
29	·49	51·9	43·7	51·1	50·5	96	10	·32	S.W.
30	29·37	47·9	37·3	43·9	42·4	88	10	·04	S.W.
								Total	
Mean	29·97	47·8	33·8	42·7	41·1	87	7·2	·75	
Mean for 27 years	29·95	49·6	37·1	43·8	42·7	91	8·1	2·47	

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DECEMBER.

Date.	Barom. Reduced	Thermometers. Max.	Min.	Dry Bulb.	Wet Bulb.	Relative Humidity.	Cloud.	Rain.	Wind.
	In.	°	°	°	°	%	0—10	In.	
1	29·25	47·7	37·5	43·1	42·7	97	10	·20	S.W.
2	·35	52·9	35·3	43·4	42·1	90	10	·48	S.W.
3	29·11	45·1	39·1	42·5	39·7	79	10	·20	S.W.
4	28·72	43·7	34·3	40·5	40·5	100	8	·04	S.W.
5	29·13	45·9	26·7	31·7	30·8	90	2	·22	S.W.
6	·02	41·9	30·3	31·7	31·6	100	10	·04	S.W.
7	·21	37·1	30·5	36·1	35·8	98	10		S.
8	29·89	39·4	27·4	35·3	32·8	78	0		S.W.
9	30·35	48·1	24·5	33·9	32·0	81	6	·07	S.W.
10	30·12	48·9	32·3	47·9	47·7	99	10	·23	S.W.
11	29·86	46·2	44·4	45·4	45·1	98	10	trace	S.
12	29·96	41·6	34·8	35·2	34·8	97	10	·07	E.
13	30·21	41·9	34·3	41·4	41·4	100	10		E.
14	·32	40·7	35·3	39·9	38·0	87	10		E.
15	·26	38·9	36·3	37·4	35·3	82	10	.06	E.
16	30·06	40·9	30·1	33·7	32·6	89	10	·04	E.
17	29·59	41·1	32·5	38·9	38·2	90	10	·32	E.
18	·37	40·2	35·3	38·9	37·8	89	10	trace	S.W.
19	·26	42·1	27·9	32·2	31·6	91	10	·03	S.E.
20	·48	38·1	32·6	32·4	31·3	89	10		S.E.
21	29·73	51·7	17·6	24·1	23·9	99	2	·48	S.W.
22	28·99	52·9	22·7	51·1	51·0	100	10	·04	S.W.
23	29·04	50·9	49·3	50·4	50·0	97	10	·19	S.W.
24	·51	44·1	28·9	31·7	31·6	100	4	·03	W.
25	·76	48·7	26·4	37·4	36·8	92	8	·08	S.W.
26	·71	51·4	33·5	47·7	47·4	98	10	·01	S.W.
27	·83	52·9	45·1	49·4	49·0	97	10	·07	S.W.
28	29·64	51·7	48·6	50·4	48·8	89	10		S.W.
29	30·07	44·5	38·9	40·1	37·9	82	10		N.
30	·38	45·6	25·0	32·3	31·6	90	10	·02	S.
31	30·15	50·4	31·3	45·4	44·9	92	10		S.W.
								Total	
Mean	29·66	45·4	33·2	39·4	38·5	92	8·7	2·92	
Mean for 27 years	29·91	42·7	32·0	37·5	36·5	88	7·9	2·28	

Total rainfall for the year, 30·22 in.
Mean for 27 years, 25·23 in.

PHOTOGRAPHIC SECTION.

1909.

BALANCE SHEET.

RECEIPTS.

	£	s.	d.
Balance from 1908	20	15	9
Lent Term—Entrance Fees		8	0
Subscriptions	1	1	0
Easter Term—Entrance Fees ...	2	2	0
Subscriptions	3	1	0
Michaelmas Term--Entrance Fees ...		6	0
Subscriptions	1	6	0
	£28	19	9

EXPENDITURE.

	£	s.	d.
Lent Term—Knight, Hypo		5	3
Lamp		1	0
Easter Term—Ifould, Dishes ...		5	6
Knight, Hypo		14	0
Michaelmas Term—Electric alterations		18	6
Padlock		1	0
Almanack		1	6
Knight, Hypo		7	0
Electric Lamps ...		2	0
Balance in hand	26	4	0
	£28	19	9

G. E. BLUNDELL.

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THE MUSEUM.

The Museum has continued to make steady progress.

During the summer the Curator and Mr. Blundell were allowed to inspect a number of the duplicate specimens at the Natural History Museum, South Kensington. Two visits were paid to the Museum when a number of skulls and skins of mammals were selected together with some stuffed birds, a representative collection of reptiles, batrachians and fishes preserved in spirit, echinoderms and other invertebrates with a selection of shells which fill several gaps in the British collection and nearly complete the general representative collection. All of these were subsequently presented to the College by the Trustees of the British Museum, to whom our best thanks are due for a most valuable gift, also to Dr. Harmer, the Keeper of Zoology, and his Staff, for the great amount of assistance they gave in the work of selection.

Other benefactors to whom our thanks are due are Dr. E. W. Willett (O.W.), for a collection of flint implements; Miss Coles for a shell of *Teredo norvegica* and a skeleton of *Euplectella aspergillum*; J. B. Brown for a sea horse; G. B. White for a specimen of *Byrrhus pilula* and C. J. Temperley for one of *Trichosoma laterale*, both found in the College grounds; and to the following for birds' eggs: O. S. Cumming, a clutch of 4 redshanks; L. A. W. B. Lachlan for 5 jackdaws, A. E. Clark Kennedy, 1 green plover; Mr. T. E. Randall for 12 shovellers, 2 pochards, 3 sheldrakes, 7 coots, 1 yellow wagtail, and 5 wrynecks.

Mr. H. W. Monckton, (O.W.), has arranged a case to illustrate the Geology of the neighbourhood in which he has included many specimens from his own collection; in this case may be seen also the collection of fossils from the London Clay made by H. R. Lupton, as described in his Pender Prize Essay, and presented by him to the Museum.

Mr. Eustace has arranged the Beetles, and Mr. Blundell has again given a great deal of time to the arrangement of the Geological collection and the mammalia.

The Curator is most grateful for the response which has been made by members of the College to his appeal in the Report for 1908. There are still many gaps in the collections, some of which he hopes will be filled during the present year by the efforts of Wellingtonians past and present. The object is, as stated last year, to obtain a collection representative of the Natural History of the British Isles, with a small typical collection in which most of the specimens are necessarily foreign.

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MUSEUM EXPENDITURE.

	£	s.	d.
Sparrow for Cabinets	53	5	0
Mounting Specimens	7	11	0
Books	6	10	0
Mounts, Labels, &c.	2	7	6
Specimen Jars	3	16	3
Methylated Spirit		15	2
Carriage and Packing	2	15	11
Enlargement of Photographs		18	8
	£77	19	6

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